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NOTES AND COMMENTS

New York, Sept. 4.—(Special telegram)—The Erie to Buffalo race will take place, after all, as originally scheduled, on Sept. 19. The Automobile Club of America has been advised, this morning, that the permission of the authorities enroute has been secured. This action is due to the threatened withdrawal of the club from all connection with automobilism at the Pan-American, the officers of the latter having, since that time, bestirred themselves with the result mentioned. They will add a $1000 trophy to the sweepstake and purse offered by the Automobile Club of America.

Vanderbilt the Champion

Newport, R. I., Aug. 31.—On a half-mile track, instead of the 9-mile boulevard, but before one of the most fashionable gatherings imaginable, the races of the National Racing Association were held yesterday. And Vanderbilt, possibly the best-known automobilist on this side of the water, proved the champion of the day. The townspeople showed by their enthusiasm their lack of sympathy with the gentry who, by injunction, prevented the racing on the better course.

The great event of the day was a 5-mile race for gasoline machines, no limit being placed on power. The most famous competitors were Vanderbilt and Foxhall Keene, who took part in the Paris-Berlin race, and they came together in the final. In the first heat Keene, who showed his disregard for the sterotyped uniform of the chauffeur by wearing a linen duster and a Panama hat, met David W. Bishop—two Mors vehicles.

At the pistol Keene went to the fore at once, and at the half mile post he was 75 yards better than his opponent. At the one and a half mile post he was one-eighth of a mile ahead, and it was not long before Mr. Bishop was a badly beaten man. At three seven-eighths miles Mr. Keene lapped his opponent, and was thus a half mile ahead. He was finally a victor by a half mile and 100 yards.

Vanderbilt met Wm. N. Murry and a 40-horsepower Winton in the second heat and for a time it seemed that he had all he could attend to. Vanderbilt got a good start, but Murry was soon holding him surprisingly close. For two and a half miles the Pittsburg man clung to his rival, being only as far behind as the distance he had lost at the start. Then the red machine slowly opened up space, and Vanderbilt was a winner by about 125 yards. His time for the five miles was 7:43¼.

It developed in the final, however, that Vanderbilt had not let his automobile out, for in the contest with Keene he did the 5 miles in 7:36¼.

In this heat Vanderbilt got off in the lead, Keene seeming to be at a standstill for two seconds after the pistol. Vanderbilt took the pole at once, while Keen, less accustomed to the track, steered a poor course, and thus lost distance at every lap.

Mrs. Vanderbilt saw the race from the carriage of a friend, and while she was unable to hide her great concern at the safety of her husband, she looked radiant as outbursts of cheers greeted him each time he came past the stand.

Vanderbilt was an eighth of a mile in the lead when half the 5 miles had been run, and from that he slowly gained distance, and was a winner finally by 10 3-5s.

There was not much excitement over the early events. The first was for motocycles, distance 3 miles, and was won by Kenneth Skinner in 5:40. G. M. Holley, who makes motor bicycles, was second. Allen Blanding finished alone in a 3-mile race for electrics. Two heats and a final were run in a 3-mile race for steam carriages. The final fell to J. McM. Hamilton, with J. Howard second. The best time was 6:20. Colonel Astor took part in one of the heats and seemed to enjoy it, although badly beaten.

Then came a 3-mile race for gasoline vehicles of 12-horsepower, run in six heats and final, won by Alexander Fisher, with E. G. Densmore second and C. Macey third. The first heat was ridden by F. Walsh in 6:06¼ and the final, extended to 5 miles, by Fisher in 9:37¼.

A race for motorettes, 3 miles, was won by O. H. P. Belmont's vehicle, W. K. Vanderbilt second, Skinner third. Time, 7:35¼.

To wind up the programme a 10-mile race for winners of all classes was run. Vanderbilt won in 15:23½, Skinner second, Fisher third, Hamilton fourth and Belmont fifth.

The series of events are regarded as an unqualified success despite opposition, dust and a track on which it was impossible for the drivers to show their best speed. Not a single accident or complaint marred the proceedings and the management was, in all respects, satisfactory.

Fournier's Plans Outlined

New York, Sept. 1.—Henri Fournier, the pioneer of motocycle racing in America and the winner of the Paris-Bordeaux and the Paris-Berlin automobile races this year, arrived by the Deutschland on Thursday. With him was Tod Sloan, ex-champion jockey, now with ambitions to shine as a racing chaffeur. The primary object of their trip was to compete in the Buffalo-Erie race and such other motor vehicle contests as might be arranged on road and track.

They naturally expressed regret that the A. C. A. had failed to get the courtesy of the road for the big race and hope that a course for the October international race may be secured. It is doubtless their intention to turn to money value their reputations as chaffeur and jockey, though they naturally do not shout this out. They are likely to prove features of all track automobile meets and the big fairs this autumn. Fournier will also give motocycle exhibitions at bicycle race meets. Of course both will be in the October race.

The noted chaffeur-jockey combine, however, has more serious business in view, nothing less than the establishment of an American agency for the famous Mors automobiles in New York. Sloan has ample capital and is willing to back the enterprise liberally. The prestige of Fournier and his victorious Mors, added to the wide acquaintanceship of Sloan with sporting and moneyed men, should give the scheme a boom from the start. The pair brought no Mors vehicles with them, but three are expected to arrive this week.

Fournier spends most of his time greeting old friends and modestly refrains from discussing his victories. He looks much fuller in flesh than when last here. There is no trace of the big-head about him. His cordial good fellowship is as ever present as before.

Fournier was originally a bicycle sprinter and was champion of France. His prestige was undimmed until he was beaten by Zimmerman, now his closest friend in this country. When motor pace was introduced in France he took it up with enthusiasm and in December, 1898, visited this country and gave a motor bicycle exhibition at Madison Square Garden. Later he joined the Orient people and was the chief pacemaker in the early record trials behind motors. He returned to France in the winter of 1899-1900 and the following spring became mechanic for Charron and de Knyff, riding with them in their big races and record trials. He was in the winning car in the first international cup race last year. This year he was secured by the Mors people and won for them the two great races of the year. In the Paris-Bordeaux race he rode 348 miles in 8:44:44. In the Paris-Berlin race he covered 750 miles in 16 hours and 6 minutes actual running time, attaining at times a speed of 65 miles an hour, his average being 53 miles. He is absolutely fearless and this has had much to do with his victories.

Laws Relative to Gasoline

Sooner or later the attention of keepers of automobile establishments will be called, in some forcible manner, to the necessity of greater care in the handling of gasoline. Indeed, the authorities are already seeking information as to the methods of handling it in the eastern states. Users of gasoline in other businesses are subjected to the strictest examination. The amount which may be stored is provided and the rule strictly enforced. In Chicago it is not legal to store more than a barrel within 30 feet of a house or other building. It is usually kept in tanks under ground. In New York the keeping or use of gasoline without special permit from the commissioner of the fire department is a direct violation of law, and yet, few livery stable proprietors take the trouble to comply with this regulation. The requirements of the New York board of underwriters for the housing, etc., of automobiles propelled by the use of gasoline, naphtha or other volatile hydrocarbon oils, adopted in May, 1900, are as follows:

"All places where this class of vehicles

are housed must be well ventilated. Gasoline or naphtha other than that in the machines, must either be kept in storage tanks or in safety cans, as hereinafter provided; and where same is kept no fire or artificial light, except an approved incandescent electric light, shall be used. Safety cans must be placed in drip pans at least 3 inches in depth, and kept in a substantially made closet in unexposed location. Where over 10 gallons of gasoline or naphtha are required at any one time, it must be placed in a tank in a well-ventilated stone or brick vault, or in a pit outside of the building, the opening to which must be closed by a fireproof door or cover, which shall be secured by a lock. The tank shall have a ventpipe carried up at least 10 feet above the level of the street, and the filling pipe, when not in use, must be closed by a stopcock. The gasoline or naphtha shall be pumped from the tank into a safety can, from which the tanks of the machine must be filled. Not over five barrels (52 gallons each) of gasoline or naphtha shall be stored on the premises at any one time, and the same must be kept in a tank, vault or pit, as above provided for. All empty barrels must be removed from the premises."

Ferries, Obliging and Otherwise

There is considerable indignation among automobile owners of New York over the recent decision of the company that operates the 92d street ferry, compelling chauffeurs to stop their engines before entering the boat. As the bridge from the ferry house to the boat, on the New York shore, is usually down grade, a number of operators have obeyed the order and coasted on to the boat, only to find, when they reached Astoria, that they had to push their vehicles up a 10 per cent grade to reach the shore. The ferry hands stand around, watch the automobilists struggle up the grade, and are only induced to lend a hand when a substantial tip is offered. The 34th street ferry, to Long Island City, is the only other ferry in the city that has adopted this rule. Many New Yorkers are kept from the fine roads of Long Island by the action of these two ferries.

In strong contrast to the action of these companies is that of the College Point ferry, which runs from 99th street to College Point. This line only asks that automobiles enter the boats after the horse vehicles, and doesn't care whether the engines are running or not. The employes of the boats are courteous to chauffeurs, and, on several occasions, the engineers have even loaned tools to those needing them for temporary repairs. College Point is the beginning of the fine roads along the north shore of the island, and when the facts become better known the line will undoubtedly enjoy the most of the automobile patronage.

Buffalo A. C. Races

The following is a list of the events arranged to take place at the Fort Erie track, Buffalo, on Sept. 26-28, under the auspices of the Buffalo Automobile Club:

Ten miles, motor bicycles; prizes two silver cups.

Ten miles, motor bicycles; prizes two silver cups.

Fifteen miles, motor tandems and quads; prizes two silver cups.

Five miles, stock steam vehicles, without appliances not regularly supplied with the machine; automatic regulators not to be set higher than 250 pounds; prizes two silver cups.

Five miles, electric stock vehicles, supplied with not more than 50 cell batteries; no appliances not included in regular equipment; prizes two silver cups.

Ten miles, gasoline vehicles, 1,900 pounds or less; prizes two silver cups.

Fifteen miles, gasoline vehicles over 1,900 pounds; prizes three silver cups.

Five miles, racing steam vehicles; prizes three silver cups.

Five miles, electric racing vehicles; prizes three silver cups.

Twenty miles, handicap, mixed vehicles, exclusive of motocycles; handicaps to be arranged according to weight, horsepower and seating capacity.

Entry fees for cycle events, $5; for all others, $10. Entries close Sept. 21, with Truman J. Martin and F. W. Peckham, racing committee of the club. Entry blanks may be obtained at the office of MOTOR AGE.

Charron Comes to Start Branch

Charron, who sailed from France on Saturday last, said before he left that he had no thought of racing in America. "My visit to the United States," he said, "is entirely connected with business. I am about to found an agency of our Paris house in

New York. I am also going to dispose of the Michelin patents in the United States, or, failing that, will found an agency there. I have also a mission to dispose of the Ferris non-slipping tire patents for the Renault voiturette and a patent for a new means of changing speed.

"I also intend to take advantage of my visit to see our principal clients, Messrs. Mackey, Bostwick, Vanderbilt, Fair, Whitney, Armour, Gates, Drexel, Payne, Clarence Postley, and find out their wishes with regard to automobiles. I also intend to visit the principal American factories and will probably make arrangements for manufacturing our machines in America. Our Paris house disposes of from 6,000,000 francs to 7,000,000 francs worth of automobiles every year and the French industry is unable to keep up with the demand.

"My partner, M. Girardot, accompanies me. We take with us a 40-horsepower touring automobile, a Panhard and Levassor voiturette and a Renault voiturette, of the kind that took part in the Paris bordeaux race."

Fournier Rides an Exhibition

Fournier renewed his acquaintance with American racegoers at Madison Square Garden last Saturday, riding an exhibition mile on a motor bicycle in 1:38 on the 10-lap track. It was on a single motor machine in this same place, three years ago, that Fournier introduced the racing motor tricycle to Americans, and there are many who remember the howls of derision that marked the start of his trial and the cheers that greeted him when he finally got under full headway. It was Fournier, also, who introduced motor pace into this country, and ran the engine of the Orient tandem that paced the first motor-paced record trials of 1898.

Cheerful Outlook for Amateurs

A report from London says that expectations of the automobile industry have been more than fulfilled this holiday season. The demand for motor carriages has exceeded the supply ten times over. At every depot in London where the machines are sold the same complaint is heard—the manufacturers are too slow. The advice of a writer in the Candid Friend to prospective automobilists has evidently been taken to heart. He says:

"The highest pleasure of automobilism is attained only by those who both drive and tend their own machines. This involves turning yourself into a mechanic. You must be prepared to don overalls and lie on your back in the mud under your car with oil dripping into your hair. You must be able to grind a valve or replace a broken exhaust spring or adjust a troublesome tumbler. Many have neither the skill nor the patience for this. They have not the mechanical turn of mind. They are not born chauffeurs. They must be content to travel with a hired mechanic and lose much of the pleasure of a sport as absorbing and fascinating as man ever invented."

The Standardization of Parts

Following the communications which have appeared in MOTOR AGE during the last two weeks comes a report from Consul Hayes, of Rouen, France, who refers in energetic language to the desirability of standardizing the component parts of automobiles. A difficulty which exists here exists also in France, namely, that of obtaining promptly new parts or pieces to take the place of those which break or wear out. Consequently chauffeurs suffer much embarrassment and inconvenience because of their inability to find readily any one capable of repairing their vehicles. Uniformity of construction would obviate this trouble and enable any carriage maker, engineer or electrician, as the case might be, to put a crippled machine in running order.

Those who remember the difficulties of the early days of the bicycle, and there are many such in the automobile industry, will recollect that many of the bicycles used in this country, for many years, came from the other side. There was one everlasting outcry for parts. The machines were so made that it was impossible to duplicate some of the parts in this country and in any event the work would have taken weeks. The result was that as soon as machines were made at home, even though they were heavier, but where parts might be obtained quickly, the English business went to the wall. Will not the same state of affairs exist in the automobile field?

Moore Settles the Judgment

The case of Royal vs. Moore has been settled by the payment of the judgment of $421 by the defendant. The case had some influ-

ence with the New York legislature, which has since repealed the law under which the judgment was rendered. The facts in the case, for those who do not remember them, were these: Royal and his wife were driving south of Ballston Spa, when an automobile came along, driven by Moore. Royal's horse became frightened and ran away, smashing the wagon. Royal brought an action to recover damages. In the court at Ballston Spa he obtained a judgment of $200, on the grounds that the driver of an automobile must send a man an eighth of a mile ahead of his machine to warn people of its approach, as required by law. The case was carried to the court of appeals, where the judgment was affirmed.

Why Sales Will Increase

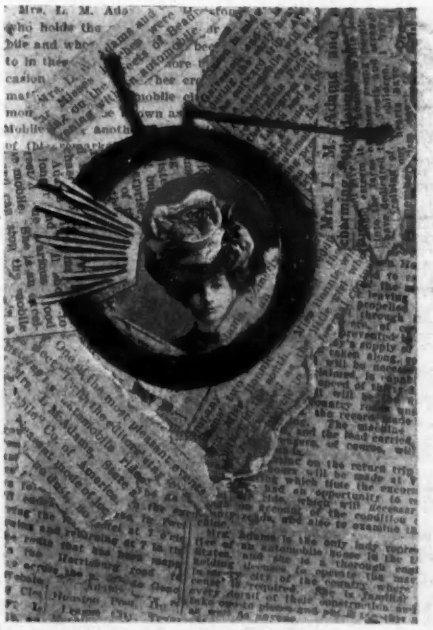
"The coming fall will undoubtedly see a big increase in the sales of automobiles," said a well-known manufacturer to a MOTOR AGE man recently. "In the first place, the great publicity given the New York-to-Buffalo endurance contests will show, in a practical manner, just what the automobile can do, and hundreds of people who have been hesitating to buy, awaiting the result of the run, will decide on the vehicle they want. Then, again, the summer sojourners will come to town with stories of the fine times they have had in automobiles at the seaside. This summer the popular man at the resorts has been the one, not with the fast horses, not the yacht owner, the golf player or the swimming expert, but the chauffeur, the owner of the vehicle, who has been able to take his guests on swift, pleasant rides. Those who have never given the automobile a thought have this year, through one or two rides in a friend's vehicle, been inoculated with the automobile germ, and it has taken. They also want to become popular, and the little they learned about the automobile has created an intense desire to know more. The result will be sales."

Winton Pays a Fine

One day last week Alexander Winton, accompanied by one of the people from the factory, aspired to show the good people of Painesville, O., what speed on an automobile meant. But the good people didn't take the exhibition kindly and caused the gentleman's arrest. By the time the warrant was issued Mr. Winton had left town, but he was finally located some miles away and arrested to await the arrival of the Painesville officers. Then he started back toward Painesville, met the marshal on the way, invited him to ride, caried him to court and there paid a fine of $25 with the remark that he "deserved it." Philosophical, and probably honest.

Original and Progressive

Mrs. L. M. Adams, president of the Houston (Tex.) Automobile Co., state agent for the Mobile, possesses a keen sense of the value of advertising and a vein of originality rarely excelled. She has made the machine she represents well known throughout the



state. Here is a picture of the lady, prepared by herself. The newspaper clippings, it will be observed, relate to the business in which she is engaged. Mrs. Adams sold three Mobiles between Aug. 18 and 27—not a bad record.

Auto Bus Line in 1835

According to the British press the motor bus is far from being the modern vehicle most people suppose it to be; indeed, it was so long ago as 1836 that Hancock's Era, afterwards named Erin, was shipped to Ireland from London. The bus only ran for eight

days, but it "effected the purpose of its visit"—whatever that may have been—and was then reshipped to Stratford. In August, 1835, the Erin ran from London to Birmingham and back, and on the strength of this performance a London and Birmingham Steam Coach Co. was formed, and more cars were ordered. Owing, however, to opposition in the shape of heavy tolls, the venture proved a failure. In 1836 Hancock made another bid for success with a service between Stratford, Paddington and Islington. The line was in operation for five months, during which 4,200 miles were covered and 12,761 passengers conveyed.

The Eisenhuth Patents

John Washington Eisenhuth, of the Eisenhuth Horseless Vehicle Co., Broad street and Exchange place, New York, has had troubles the past two years, according to a story the gentleman gave a MOTOR AGE man last week. According to his story, Mr. Eisenhuth has had a 2 years' fight with parties who wanted to control his company, and as in the melodrama, where virtue is always rewarded and the hero wins hands down, Eisenhuth is bowing to the applause of the gallery and the conspirators are foiled and are not longer in evidence.

Eisenhuth is undoubtedly a mechanic and an engineer of no mean ability. For 10 years he has been working on automobiles and he has patent papers, dated all the way from 5 to 10 years ago. They cover the generation of power by electric ignition of gasoline and air, steering knuckles, a design patent on a flexible running gear, and an engine which the company intends to use, of the rotary type. This engine, Mr. Eisenhuth says, the company intends to manufacture up to 10,000 horsepower. Eisenhuth says he has been working on the gasoline engine for 26 years. He is of opinion that the Seldon patents are not a foot high in comparison with his, which, he maintains, will have to be figured with in the near future.

Those Extraordinary Frenchmen

Writing a few days before Fournier's departure from France Walter Wellman, then in Paris, said of the famous chauffeur:

He is to-day the best known man along the boulevard. Let us suppose you are sitting in front of one of the cafes, sipping your beer—every one drinks beer in Paris nowadays, for Paris is slowly becoming German—a roar is heard out on the boulevard, something red and white is seen dashing by at a speed far beyond the legal limitations; suddenly all the people jump up from their little chairs and cry out, with the Parisian hero-enthusiasm: "Voila Fournier! Vive Fournier!"

If in driving through the Bois de Boulogne you see a red and white streak going around a turn like a mountain train taking a sharp curve on the down grade, your cocher will for once in his life rouse himself from his lethargy and inform you:

"C'est Fournier—the great Fournier—le plus grand chauffeur!"

When Fournier, with roar and flourish, approaches the Pavilion Armenouville, the swellest roadhouse in Paris—the place where they unblushingly charge you 2 francs 50 centimes for one blushing peach—the guests rush from their tables to greet him and to ask him to have a drink.

When Fournier makes his appearance upon the Avenue de la Grand Armee, the automobile center of Paris, the people rush out and surround him and shake his hand tumultuously.

Retirement of Mr. Eddy

Many and varied have been the surmises concerning the retirement of Mr. Eddy from the presidency of the Chicago Automobile Club. Mr. Eddy has been interviewed. That he has not been correctly quoted we are prepared to believe for the reason that the sayings credited to him were not gentlemanly. The facts are simple. Mr. Eddy failed to attend any of the club runs and had been present at a meeting only once in six months. The club was not flourishing as it ought to do because of the lack of an energetic leader. And so the club appointed a committee of one—to wit, the secretary, who has always been most friendly to Mr. Eddy—to call upon him and ascertain whether he could not devote more time to the club, or, failing that, whether he would not be willing to make way for some one else, so that the work so necessary to the club's well-being might be carried on.

This news was communicated to a newspaper reporter and by him magnified. The publication of the item occurred, unfortunately, during Mr. Eddy's absence from the city and of course before the secretary had an opportunity to see him, and this fact

evidently caused the ex-president some irritation. He has since been credited with referring to the members and their conduct of club affairs in anything but a complimentary manner. To this the club will probably give no attention. It has elected a new president, added some of the best men in the club to the board of governors and has in hand plans which will insure the lasting prosperity of the institution.

A full meeting of the board of governors was held last week. The subject of a clubhouse was under discussion and a guarantee fund was started there and then by the governors and one or two of the commoners who had been invited to be present, amounting to $1,100. Thursday evening of this week the club will meet and the board will lay before the members a lot of information relative to its intentions which is expected to result in a great boom in the membership. The governors declare that they will have a membership of 200 before the first day of the new year.

A Visit to Vanderbilt

The good people of Newport, if the correspondent of the Boston Advertiser at that point may be believed, are much enraged at what they call "the red devil" crowd, meaning, of course, the Vanderbilts and others who operate speedy automobiles. Newport, it appears, has an ordinance which regulates speed to 6 miles an hour in the city and 10 outside, but, although no one denies that the rich people break the law every day, there have been few arrests, except of a colored man who has been fined three times and dismissed with a warning twice.

Perhaps one of the causes of complaint is that Vanderbilt declines to be interviewed concerning speed, automobiles or anything else in that connection. One correspondent tells of a visit he paid to the Vanderbilt establishment. This summer, he says, Mr. Vanderbilt has rented the Coats cottage on Brenton road, in the King estate. The property is about midway between the east and west shores, and from the house, which sets upon an elevation, the view of old ocean is good. The location is isolated. The architecture is somewhat after the old English manor style, but the exterior is stucco. When I arrived the terrible "White Ghost" and awesome "Red Devil" were having the hose played on their wheels to wash off the mud before being rolled into the corrugated iron shed, which has been constructed for the especial housing of the monsters. The "Red Devil," imported recently, was built to order, and has developed 43 horsepower and 74 miles an hour.

Only a moment or two did I have to look at the machines when I was warned off by the chauffeurs. Vanderbilt hires six or eight men to look after his machines, and all are French. The slate hung up on the wall bears the inscription "ordres."

When I expressed a desire to learn about the merits of the two machines, the reply was "No spik Anglaish." A repetition of the desire in the chauffeur's native tongue provoked a torrent of French, but all it amounted to was that he was very sorry, but his orders were very strict. M. Vanderbilt would allow no "friends" to visit him. So after a farewell glance around I departed. Besides the "Ghost" and "Devil" the Vanderbilt automobile stock includes a runabout, made by a Chicago concern, for Mrs. Vanderbilt. He has also experimented with numerous other varieties, including motor tricycles and bicycles.

At the house door a servant courteously showed me in and took my card, saying he would see if Mr. Vanderbilt was at home.

Everywhere was a profusion of lamps, chiefly crystal and silver, in quaint design, with large silk shades in delicate coloring, but one was a telescope lamp of wrought iron, with deep crimson shade.

Scarcely was there time to observe even so much, when a female voice was heard berating the servant for allowing any newspaper persons to enter at all. The unfortunate servant speedily reappeared, with flushed face and troubled mien. But his voice was calm.

"Mr. Vanderbilt cannot see you," he said, steadily.

The first two floors of the new house of the Massachusetts Automobile Club are ready for occupancy and the house is to be turned over to the club, complete, on October 1. The proposed amalgamation with the Automobile Club of New England seems to have fallen through by reason of lack of interest.

The latest Panhard in Chicago belongs to E. B. Shaw, a brother of the tourist of that name who came from New York to Chicago. E. B. Shaw rode as far as Buffalo and then

put his machine on a boat and came on by train. While in Europe he secured the agency for the state of Illinois for the Panhard and the Renault. The latter has won nearly all the late contests for light vehicles. It is fitted with a De Dion motor.

The bicycle, in its palmiest day, did not furnish the space killer of the daily press one-half the sensational nonsense credited to the automobile. If one-half the stories invented were carried into effect there would be racing in every hamlet in the United States by all the celebrities in the universe. According to the wiseacres Chicago is to have a race meeting in which about 40 machines will take part, some time this month. Strange to say, no one alleged to be interested has any knowledge of the matter.

W. K. Vanderbilt, Jr., was fined $10 and costs of $2.60 for overstepping the speed limit at Newport last week. He was "arrested" by mail, admitted the offence and paid the damages cheerfully. When he received his change he bade a smiling good morning to Judge Baker, and quickly boarding his automobile, which was awaiting him at the door, flew up Mill street at a clip which made the justice rub his eyes in astonishment.

There is much talk in Italian society about the entire royal family having become chauffeurs. The king started the movement and the princes followed his example. It is now a common matter to meet the princes and even the king driving their automobiles themselves. The ministers have also followed the example and some of them are often met on the way to the palace. The king rides a French 12-horsepower phaeton.

The Springfield (Mass.) Automobile Club is contemplating holding a tournament in the fall. The club, which was recently organized, has the following officers: President, Dr. A. O. Squier; vice presidents, F. A. Hubbard, C. W. Johnson of Holyoke, and Mr. Moore of Westfield; secretary, Dr. G. H. Finch; treasurer, Dr. W. R. Weiser.

Automobiles have been barred from the dual-county fair of the Queens-Nassau Agricultural Society, of Long Island, on the ground that they "might cause a stampede of horses which no money could pay for."

The general agent in Holland for one of the largest automobile makers in Paris always rides on a new vehicle he buys from the factory to his home in Holland. He declares that this is the only way to test the vehicle. It is stated that since March, this year, he has bought 36 vehicles and has ridden all of them from Paris to Holland.

Hamilton (O.) expects an automobile factory to locate there. John W. Wade, of Cincinnati, has been there looking for a site. It is pointed out that Cincinnati is the center of the carriage trade and that the manufacture of automobiles in the neighborhood would be a natural development.

The Pemberton Mills Co., of Lawrence, Mass., has in process of construction an automobile track, to be used around the yard for heavy work. It will be 14 feet long and 6 feet wide and will have a capacity of two tons. An important part of the equipment is an engine of 15 horsepower.

In reply to an inquiry as to the two automobiles which are said to be in course of construction at the Studebaker factory, the company writes that it is "compelled to state we cannot, at this time, give you any definite information respecting the matter."

The Winton company commenced last week the publication of a house organ, known as the Motor Era. It is handsomely arranged and contains a great deal of information of interest to and about users of Winton vehicles.

The automobile races at Newport were finally stopped by injunction. Judge Wilbur, sitting at Providence, granted a temporary injunction on Aug. 26 and continued it indefinitely the next day.

The people of Newton, N. J., are trying to raise $50,000 to secure the location there of an automobile factory, identity unknown. About $18,000 has already been subscribed.

Willie K. Vanderbilt, Jr., says that he has heard of no opposition to the Newport automobile races. Did you know before that Mr. Vanderbilt was deaf?—Boston Globe.

Mr. and Mrs. Bert Shaw will sail for Europe about the first week in October and will do considerable touring while there.

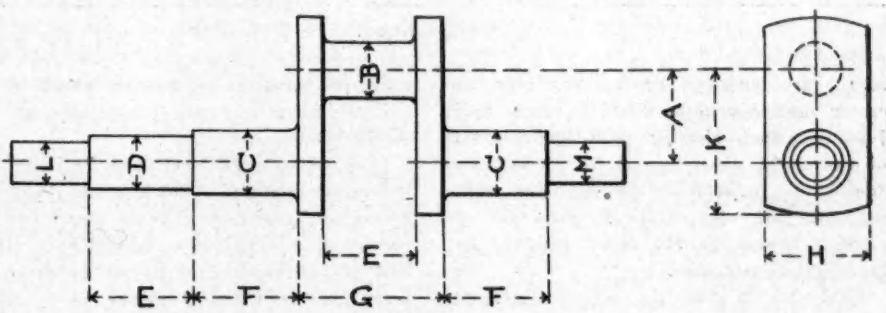
The city council of Toledo has refused to pass a foolish ordinance restricting the speed of automobiles to 6 miles an hour.

Randolph Walker, of the Mobile company, is expected in Chicago some day this week.

DIMENSIONS OF GASOLINE MOTOR PARTS

Four or five years ago the writer of this article was called upon to design a gasoline motor for automobile use. He had a great deal of experience in stationary gas and gasoline engine work but found that sources of information relative to the later form of motor were few and the information obtainable therefrom extremely limited. The higher speed, lighter weight and smaller space necessary in the successful motor for automobile use rendered the data on the subject of existing motors practically useless, at least so far as dimensions were concerned. Even today the state of the art is such that information relative to certain important factors will be valuable to many now engaged or contemplating engaging in the industry. Hence, there are here presented a series of tables of dimensions without the necessarily complicated figuring by which they were obtained. As a matter of fact, they were obtained in most cases from actual practice. The present article will deal with the crank shaft, valves and two-to-one reduction gearing.

Table No. 1 gives the dimensions of single-throw crank shafts for motors of from 3 to 8 inch stroke and from 1 to 8 horsepower. The letter A in the table gives the throw of the crank, which is, of course, half the stroke of the motor, while B gives the diameter of the wrist pin. The parts marked C are the crank shaft journals. D is the seat for the fly wheel, L for the driving



GENERAL DIMENSIONS OF SINGLE THROW CRANK SHAFTS.

From 1 to 8 Horse Power at Speeds Given.

Horse Power.	A	B	C	D	E	F	G	H	K	L	M	Revs. Per Minute.
1	1½	⅞	⅜	⅜	1¾	1¾	2¾	1¼	2⅛	⅛	⅛	750
1½	1¾	1	1 1/16	⅜	1⅞	2	3	1 7/16	2½	⅜	¾	725
2	2	1⅛	1 3/16	1 1/16	2	2¼	3¼	1⅝	2⅜	⅜	⅜	700
2½	2¼	1¼	1 5/16	1 3/16	2⅛	2½	3½	1⅞	3 1/16	1 1/16	⅞	675
3	2½	1⅜	1 7/16	1 5/16	2¼	2¾	3¾	2	3⅛	1 3/16	⅜	650
3½	2¾	1½	1 9/16	1 7/16	2⅜	3	4	2 1/16	3⅞	1 5/16	1	625
4	3	1⅝	1 11/16	1 9/16	2½	3¼	4¼	2⅛	4 1/16	1 7/16	1⅛	600
5	3¼	1¾	1 13/16	1 11/16	2⅝	3½	4½	2 3/16	4 3/16	1 5/16	1¼	575
6	3½	1⅞	1 15/16	1 13/16	2¾	3¾	4¾	2¾	4⅞	1 11/16	1⅜	550
8	4	2	2 1/16	1 15/16	2⅞	4	5	3	5⅛	1 13/16	1½	525

TABLE NO. 1.

gear or sprocket wheel, as the case may be, and M for the pinion of the two-to-one reduction gear of the motor. The relation of the remaining letters in the table to the crank shaft are clearly shown in the drawing. The bushings or bearings for the crank shaft journals should be made from 1-16 to ⅛-inch shorter than the journals of the crank shaft, so as to prevent any binding or interfering between the bushings and the hubs of the flywheel and reduction pinion at the outer ends of the bushings or bearings.

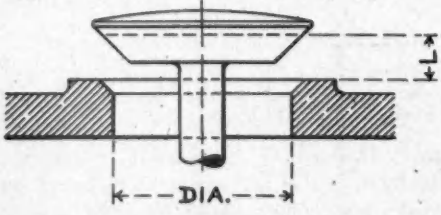
DIAMETER OF INDUCTION VALVE OPENINGS.

Bore and Stroke.	SPEED IN REVOLUTIONS PER MINUTE.						
	450	600	750	900	1200	1500	1800
2¾ x 2¾				¾	⅞	1	1⅛
3 x 3			1⅛	⅞	1	1⅛	1¼
3½ x 3½		1⅛	1	1⅛	1¼	1 7/16	1 5/16
4 x 4	1⅛	1 1/16	1 3/16	1 5/16	1½	1¾	1⅞ *
4½ x 4½	1⅛	1 5/16	1 7/16	1 9/16	1 11/16	2 1/16	2¼
5 x 5	1 5/16	1 9/16	1 11/16	1⅞	2 1/16	2 7/16	
5½ x 5½	1½	1¾	2	2 1/16	2½		
6 x 6	1¾	2	2¼	2½			
6½ x 6½	1 11/16	2¼	* 2½				
7 x 7	2 1/16	2½					

TABLE NO. 2.

Table No. 2 gives the proper diameters for the induction valve openings—that is to say, the diameter necessary to draw a full charge of mixture into the cylinder at the speed given in the table. The theoretical velocity of air into a continuous vacuum is 1,157 feet per second, but any formula based upon this deduction will give dimensions for valve openings of such infinitesimal diameters, even if a wide margin is allowed for existing conditions, that they are impracticable. The black line in table indicates the limit of size to which valves can be made to work practically at the speeds given.

In most automobile motors the induction valves are operated atmospherically and not mechanically, but the exhaust valves require operating mechanism as a matter of fact. The proper amount of lift to be given to induction or exhaust valves is a much mooted question among automobile mechanics. Therefore table No. 3 gives the proper height or lift for mechanically operated



LIFT OF VALVE FOR FULL OPENING.

*To give area equal to area of valve opening, less area of valve stem.

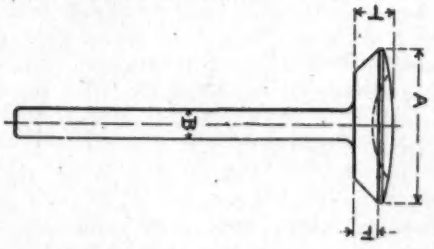
Diameter of Opening.	¾	⅞	1	1⅛	1¼	1½	1¾	2	2¼	2½
* Lift of Valve.	¼	5/24	⅙	3/16	1/12	⅛	7/72	2/18	3/24	1/8

TABLE NO. 3.

valves, having face angle of 45 degrees, the angle generally used, and which gives the best results. In calculating the lifts given in the table the diameter of the stem has been taken at one-third the diameter of the opening, which deduction for exhaust valve stems agrees closely with good design. The area of the valve stem has been deducted from the actual valve opening, and the result used as the basis of the results given in the table, so that the lift given in the table for any desired opening allows for a full and unthrotted passageway through the opening, and in or out of the valve chamber. A valve having a flat seat does not require as much lift as one with a beveled seat, but they are not in general use and are not to be recommended.

Table No. 4 gives the dimensions of inlet and exhaust valves and stems. The type shown in drawing is crowning on top, and should have a generous fillet at the junction of the valve stem with the valve proper. A slot should be milled in the top of the valve as shown, to insert a screwdriver, which can be used in a brace, to grind or regrind the valve to its seat. The slot should be milled in as shown and not cut straight through, or the whole purpose of the crowned head or top of the valve proper will be nullified, as it is intended to stiffen the valve and prevent warping or cracking from heat.

Table No. 5, with its accompanying drawing, gives a list of spur gears and pinions, adapted to the crank shafts dimensions in Table No. 1. The holes in the hubs of the spur gears are intended to go on over the sleeve of the exhaust cam, as is general practice at present. It is desired to reverse the conditions and place the exhaust cam upon the hub of the gear, the bore of the hole and diameter of the hub can be changed to suit the existing conditions. To readily ascertain the outside diameter of any spur gear or pinion not given in the table, having selected the diametral pitch to be used and the pitch diameter of the gear or pinion, add two parts of the diametral pitch selected to the pitch diameter of the gear or pinion, the result will be the outside diameter of the gear.



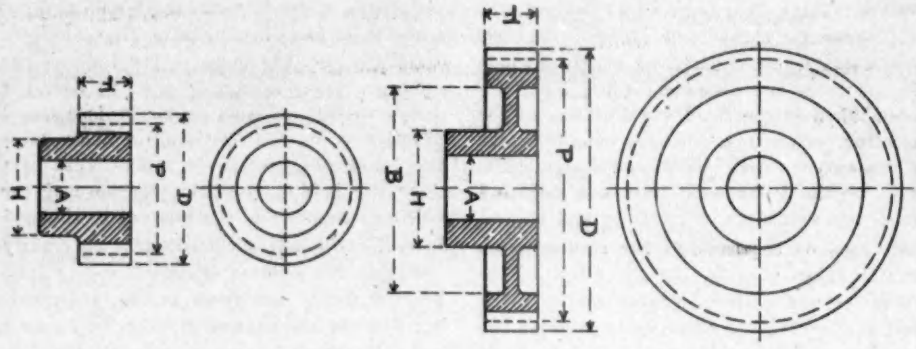
DIMENSIONS OF VALVES AND STEMS.

Diameter of Valve Opening	INDUCTION VALVES.				EXHAUST VALVES.			
	A	B	F	T	A	B	F	T
¾	1 3/16	7/32	1/8	7/32	7/8	9/32	3/16	5/16
⅞	1 3/16	7/32	1/8	7/32	1	9/32	3/16	5/16
1	1 1/16	¼	5/32	9/32	1 1/8	5/16	7/32	3/8
1⅛	1 3/16	¼	5/32	9/32	1¼	5/16	7/32	3/8
1¼	1 5/16	9/32	3/16	11/32	1⅜	11/32	¼	7/16
1⅜	1 7/16	9/32	3/16	11/32	1½	11/32	¼	7/16
1½	1 7/16	5/16	7/32	13/32	1⅝	3/8	9/32	1/2
1¾	1 13/16	5/16	7/32	13/32	1⅞	3/8	9/32	1/2
2	2 1/16	3/8	¼	15/32	2⅛	7/16	5/16	9/16
2¼	2 5/16	3/8	¼	15/32	2⅜	7/16	5/16	9/16
2½	2 7/16	7/16	5/16	9/16	2⅝	½	3/8	5/8

TABLE NO. 4.

Example: Pitch diameter of gear is 4 inches; diametral pitch to be used to No. 6, then 4 plus $\frac{2}{\text{Diam. pitch}} = 4 + \frac{2}{3} = 4\frac{2}{3} = 4\frac{1}{3}$ or outside diameter of gear required in inches.

To calculate the inner diameter of the rim of the gear, which should be slightly more than four times the depth of the tooth



GENERAL DIMENSIONS OF SPUR GEAR AND PINION

For Two-To-One Reduction for Cam-operating Mechanism.

Horse Power of Motor	GEAR						PINION					Diametral Pitch No.	Width of Face--F
	P	D	B	A	H	No. of teeth	P	D	A	H	No. of teeth		
1	2 5/8	2 3/4	2 1/8	7/8	1 3/8	42	1 5/16	1 7/16	1 1/16	1 1/8	21	16	3/8
1 1/2	2 3/4	2 7/8	2 1/4	1 1/8	1 7/16	44	1 3/8	1 1/2	3/4	1 3/16	22	16	7/16
2	3	3 1/8	2 7/16	1	1 5/16	36	1 5/8	1 3/4	1 1/16	1 5/16	18	12	7/16
2 1/2	3 1/16	3 1/8	2 3/4	1 1/16	1 5/8	38	1 7/16	1 3/4	7/8	1 3/8	19	12	1/2
3	3 1/8	3 1/8	3 1/16	1 1/8	1 3/4	36	1 5/16	2	1 1/8	1 1/2	18	10	1/2
3 1/2	3 1/8	4	3 5/16	1 3/16	1 11/16	38	1 5/16	2 1/16	1	1 5/16	19	10	9/16
4	4	4 1/8	3 5/16	1 1/4	1 11/16	40	2	2 1/8	1 1/16	1 1/4	20	10	5/8
5	4 1/2	4 3/4	3 7/8	1 5/16	2 1/4	36	2 1/4	2 1/2	1 1/4	1 7/8	18	8	5/8
6	5	5 1/4	4 3/8	1 3/8	2 1/8	40	2 1/2	2 3/4	1 3/8	2 1/8	20	8	11/16
8	5 3/8	5 3/4	4 7/8	1 7/16	2 7/16	44	2 3/4	3	1 1/2	2 1/4	22	8	3/4

TABLE NO. 5.

less than the outside diameter, subtract five parts of the diametral pitch from the pitch diameter of the gear.

Example: Pitch diameter of gear, as before, 4 inches; diametral pitch No. 6. Then 4 minus $\frac{5}{\text{Diam. pitch}} = 4 - \frac{5}{6} = 3\frac{1}{6}$ or inner diameter of rim of gear in inches. For ordinary purposes the above rules will suffice to calculate the outside diameter of a gear or pinion, or the inner diameter of the rim of a gear, not given in the accompanying table, without going into the details of the diametral pitch system of gear cutting, which scarcely comes within the limit of this article.

FROM CORRESPONDENTS

Minneapolis, Minn., Sept. 2.—To the Editor: As an old gas man, who has experimented with gases of nearly all kinds, I am naturally interested in the articles which have appeared in your paper relative to a gas invented, or rather discovered, by Mr. Strowger, of Rochester. We gas men have been credited with some wonderful tales before now, but I never ran across one quite so surprising as the statement that the gentleman at Rochester can make his gas and give it away and still become rich by means of a by-product "of great value." In other words, he has obtained something from nothing.

But if the gentleman has discovered the gas he thinks he has, minus the other feature, he will have conferred a boon on mankind. He states that one cubic foot of his gas, compressed 500 to 1, is equal to 3,000 feet of coal gas, or city gas, as he prefers to call it. The latter does not always yield the same amount of heat, but it may be accepted in a general way that 5 gallons of 72 degree of gasoline contain about the same number of heat units as 1,000 cubic feet of coal gas. Therefore one foot of Mr. Strowger's gas would do the same work as 15 gallons of gasoline. Of course if we can eventually successfully use gasoline of lower grade we shall obtain more heat, but there is no possibility of ever getting down to the point mentioned by Mr. Strowger.

If, therefore, the gentleman's theories prove correct, we shall be able to run our gasoline vehicles about four times as far as we can now with the same bulk of fuel, or perhaps 500 miles with the same carrying capacity as we now have. We might be able to do away with all such troublesome things as carbureters and mixing devices for anything compressed to the extent Mr. Strowger claims will yield pressure which would enable us to force the engine to take the charge, whether it wanted to or not. As to owners of steam vehicles, they would do away with that greatest of all troubles, the air pressure on the gasoline tank. They would be able to eliminate danger, for the greatest now is from the pressure placed upon the gasoline.

I sincerely hope Mr. Strowger is right. But I doubt it. I have seen so many thousands of cases of similar character, all of which eventually failed because of some apparently trifling detail which the inventor or discoverer had overlooked. Therefore I do not believe it will be advisable to lead the automobilist to believe that he will be able to fit his machine with the Strowger outfit for awhile. Even though it may eventually be successful it will take a long time to place it in marketable shape—like the Edison battery.—Yours, etc., T. W. C.

A Shocking Experience

Rye, N. Y., Aug. 24.—To the Editor: I have been using a Mobile this summer and fitted to it a Marsh pump. The rubber tires act as an insulator and the friction of the pump charges the machine with electricity so that at times I have received quite a severe shock through the metal frame of the dashboard. Others, perhaps, have had the same experience.—Yours, etc., C. Ewen.

A Maker Who Values His Name.

Pittsburg, Aug. 26.—To the Editor.—Your department "From Correspondents" is to me one of the most interesting of your paper. In the last issue I see a letter from J. S. Rogers, who suggests an interchange of experiences, with a view to advising one another what to avoid. He tells a tale well calculated to cause the reader to seek to avoid a similar experience, but he omits the name of builder, so I fail to see how we are aided in avoiding that party. He does, however, give the name of another whom he strongly recommends,

both for his business methods and his product. Regarding this latter party, I do not wish to say a word, but I do not think his product will meet the approval of every purchaser so fully as it does that of Mr. Rogers. Having sold my steam carriage used during past year, and been disappointed in the one I had ordered to take its place, I am temporarily out of a rig, and a friend very kindly loaned to me his 5-horsepower machine of kind approved by Mr. R. I do not wish to speak against this vehicle, for I find it excellent in many ways, but would caution any one to whom noise and vibration are serious objections to try a ride in one before purchasing. I find these so bad as to be quite prohibitive to persons in delicate health.

As intimated above, I had ordered another steam wagon. This was from a builder who has been developing his rig for a long time, but only putting them on the market this season. I waited just 5 months past the time originally named for delivery, but in this case no advance payment was demanded with the order. When ready to ship, however, I paid the full price, with $10 for crating, and then there was further delay of 10 days before it started. When it came, I uncrated and set it up, and was delighted with the many improvements over my former steam wagon, but it took a long time to get up steam, and after starting would not keep it up as I considered it should. I presume the burner was defective, or the boiler smoked up by their trials at factory, and probably I could have corrected it by taking off the burner; but I hesitated to do so lest the maker should think I had caused the whole trouble by meddling, so wrote him stating the trouble.

This was Thursday, at 5 p. m. By 1 o'clock Friday I received a telegram requesting me to ship machine back and they would refund the money; and by first mail Saturday came a check for whole amount including crate. This was before I had shipped the rig, so I had it and the money both in my possession at once, though I had never seen any one connected with the firm, and was entirely unknown to them, except from my correspondence in ordering. I shipped it, prepaying freight, and before it reached them they wrote asking me to inform them what I had paid on transportation, both ways, and have since repaid my entire outlay, including hauling here from freight station, amounting in all to $46. This will show that all builders of steam rigs are not like the one Mr. R. struck. This one should, by next spring have gotten everything in working order, and I hope then to have one of their wagons. If you care to publish the name, it is the Overman Automobile Co.—Yours, etc., West Penn.

An Iowa Gasoline Carriage

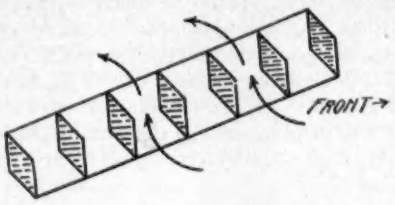
Waterloo, Iowa, Aug. 30.—To the Editor: Inclosed is a photo of my own taking of my first automobile. I started it two years ago this summer when little wanted in the line could be bought. I bought the tires and rims and built up the wheels myself as well as the entire running gear, compensating gear, etc. I also made the body, seat and top entirely myself.

The engine is of the double-cylinder balanced type, cranks set at 180 degrees, 3¾-inch bore and 4-inch stroke; water cooled and all of my own making except one cylinder, which I bought. I have since put on my sparker, new valves, lighter piston and steel pitman, and so think it is as much my own make as the other fellow's. I use the hammer break ignition and can run the engine on a single dry cell.

The rig is controlled by two handles on

the center post and one foot pedal. The upper handle, which I have in my left hand, stears the vehicle, while the one in my right throws the clutch by a backward motion. By twisting it around more explosive mixture is admitted to the cylinders and the spark is advanced. The high gear is always in mesh except when the foot pedal

is pushed, when it is disconnected and the low gear is switched in. This change cannot be made when the clutch is set, as there is means to prevent it. No part of the low gear is in motion when the high gear



is used. The clutch is of my own design and works perfectly. When the high gear is in mesh it can be started as slowly as one wishes and without the least jerk.

The box contains everything except muffler and cooling tubes, which are placed just back of the front axle and are made of galvanized iron, diamond shape in cross section and twenty inches long. See cut of cross sections. The diamond tubes are slanted so the air passes up through them and they cool the water well. I can attain a speed of fifteen miles per hour easily. All bearings are ball, even the steering knuckles. The engine can be started from the seat by a telescoping lever, which cannot be seen, or from the ground on left side.

I have received many pointers from MOTOR AGE, and should I build another it would be a great improvement, yet this works finely, and you cannot feel the least vibration when riding. In the picture my wife and I are in the rig. She is not as colored as you might think from the picture. The sun shone brightly and she was shaded. I send you this photo that you may know what we are doing out in Iowa in the auto business.—Yours, etc., S. A. Asquith.

Standardization of Parts

Milwaukee, Wis., Aug. 29.—To the Editor: In reference to the standardization of parts we would prefer, rather than otherwise, to have the material in our steam vehicles so standardized that in case of accident or trouble there would be no difficulty in ordinary repairs being made by an ordinary mechanic. We believe, however, that it is a little too early to expect this condition, as the whole business is in such an experimental state that really no manufacturer has yet settled down to standard construction. Rather frequent changes appear desirable, and until these are worked out the standardizing is left in a waiting state. We have put our style "K," a one-seated vehicle, in the 500-mile endurance test from New York to Buffalo next month, and quite hope to come out somewhere other than the tail end.—Yours, etc., Milwaukee Automobile Co., W. H. Starkweather, President.

Syracuse, N. Y., Aug. 29.—To the Editor: Regarding the "Standardization of Parts" and the sizes of steam and water pipes, we agree, generally, with the suggestions made in this article, as to the size of piping, but we take the same stand we always did in the manufacture of bicycles—that each individual manufacturer who wishes to make a success of his business must build his own individual goods. Kindly compare this with the gun business. Are all makes of guns standard, the parts of each being interchangeable with those of another make? We do not think so. Also compare it with the typewriter. Both are standard-manufactured articles in the United States. Even lawn mowers—sold at the low prices that they are—are not interchangeable with parts of competing machines.

Why do you not publish your paper in exactly the same form, using the same arrangement of matter, advertising, etc., that every one else does? This, of course, is a little harder to make a comparison with; but we think you will appreciate the point. You have a paper which you, naturally, think is the best published, and prefer to carry out your own ideas. This, we think, is as it should be. The man who has the best, finds no difficulty in disposing of his product, even though he protects himself from all kinds of imitations. Of course, in such matters as the sparking plugs referred to in your article, we think one standard should be adopted, as it is very unlikely that any one automobile company will ever be benefited by making its own sparking plugs.—Yours, etc., Century Motor Vehicle Co., Wm. Van Wagoner, engineer and manager.

Rochester, N. Y., Sept. 3.—To the Editor: We appreciate your effort to obtain information of interest to the automobilist, and wish to say a few words, which are prompted by the letter on "The Standardization of

Parts," which appeared in your columns last week. No one, better than the manufacturer, knows where his product can be improved; but, likewise, he alone realizes what difficulties attend the slightest change in the construction of a standard article. We have, from the beginning, sold regular sizes easily duplicated on the open market in all the details of our carriages. No one can, with any degree of truth, deny the advantage of having all pipe fittings and bolts of standard thread. It is certainly better for the user, and secures a certain economy for the maker.

The remarks on the uniformity of steam and water piping have considerable merit, though we do not follow them completely in practice. We, long ago, adopted ¼-inch as being best suited to the requirements of the pump, suction and discharge, the blow off and the water column connections, and have been well repaid by the absence of friction and the freedom from clogging. The regulator and steam gauge, however, we continue to connect with ½-inch pipe, for this reason: They are both supplied with condensed steam, from which there is practically no danger of stoppage, and they have means provided whereby this distilled water may be drawn off if the user desires to take this precaution. We have never found the necessity of using larger than ¼-inch pipe on our air line from tank to gauge, though it would be necessary to increase this and the gasoline pipe to obtain a uniform size throughout.

We are using two sizes of piping, because each has done its work well; each is standard and easily replaced; because of the fact that one change, as suggested in the letter mentioned, would necessitate so many other changes as to almost require the bringing out of a new model; and, last, and perhaps most important, we have been working along other lines which appealed to us as offering more valuable returns.

With reference to that part of the letter pertaining to the securing of duplicate parts of the machinery outside of the factory, we must say that the idea is identical with our own. The life of the engine usually determines the duration of usefulness of the carriage. In nearly all cases the engine is the most difficult part to repair; but, if care is taken in the selection of the materials to withstand the wear, it can be so arranged that only those parts will need to be replaced which can be duplicated with greater ease and by any ordinary repair shop.

Mr. Mitchener's letter, in your paper, appeals to us very forcibly as voicing our own sentiments of two years ago. At that time we were producing a carriage, such as he suggests, with all the mechanism crowded into the smallest possible area. It weighed about 800 pounds. Our present model scales 1,250 pounds, an increase of 450 pounds of the essence of experience. In our older models, the gasoline tank being immediately in front of the engine, made it very difficult of access from the front and impossible from either side. Our standard machines of today are so constructed that the driver can remove the footboards and stand, stoop, kneel or sit on the ground in front of the engine, if such a thing becomes necessary, and have plenty of elbow room to work all around. The dash of the earlier types has been replaced by an extension of the body, forming a roomy compartment, containing the tanks and tools, and leaves room for quite a number of parcels.

Regarding Mr. Mitchener's remarks relative to the steam vehicle's being intended for boulevard use only, we believe that ten other manufacturers having steam vehicles entered in the New York-Buffalo race, will agree with us to allow the results of that contest to make the only satisfactory and convincing answer.—Yours, etc., Foster Auto. Mfg. Co., per S. D. Waldon.

Advantages af Three Wheels

New York, Aug. 28.—To the Editor: I wish to thank you for the way in which you illustrated and described my automobile vehicle patent in the last number of the MOTOR AGE, for although I expected a notice of some kind would appear, it pleased me to find such a very satisfactory one.

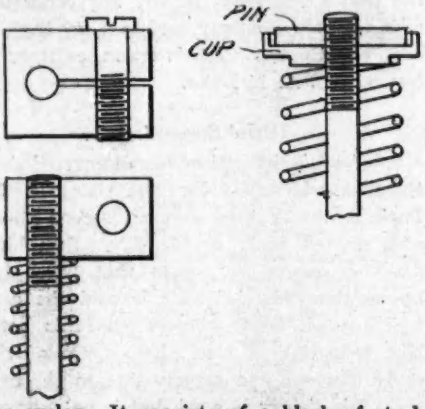
In reference to your remark that three-wheel machines do not track and are therefore not suitable for use on country roads, I would like to say that there are a great many four-wheel vehicles which do not or, what is worse, track differently for each axle. Moreover, there are comparatively few roads where this feature would be of much importance, and the advantages of the easy steering and simplicity of a three-wheeler far outweigh any slightly greater inconvenience that may be encountered in passing over them. Besides, the fact that with three wheels a stone or other obstruction,

unless of extraordinary width, cannot strike more than one wheel and deliver more than one blow to the vehicle in passing over it is a great advantage and tends to decrease the importance of having the wheels track, as when they do the blow is usually double—the obstruction first hitting the front wheel and then the rear, and, to make matters worse, subjecting the frame to two opposite twisting strains as the wheels rise, which with three wheels are entirely eliminated.—Yours, etc., A. E. Osborn.

To Secure Valve Springs

Chicago, Aug. 26.—To the Editor.—I find that one of the annoying features in some makes of motor cycles and in large types of gasoline motors is the loosening of the nuts or devices used for holding the springs in place on the intake and exhaust valves. These defects, while not serious, are often the cause of inconvenience, delay and burned fingers.

Having had experiences of the kind mentioned I have used the methods illustrated herewith with success, the clamping block being similar to that used on Thomas motor cycles. It consists of a block of steel, into one side of which is a threaded hole to allow of its being screwed onto the valve stem. In the other side and parallel with the threaded hole and running into it is a slot. A screw is used to draw the two ends together, thereby clamping the valve stem securely and with little danger of its ever coming loose.



The second, and what I believe to be the best method, is to make a cup-shaped disk with hole through the center to admit of its slipping over the valve stem. Provide a pin long enough to fit into cupped portion of the disk and drill hole through valve stem. To assemble, put spring in place, slip cupped disk over stem, with cupped portion away from spring; then press both cup and spring down until pin can be inserted through hole in valve stem, after which the spring may be released. This will force the cup over the pin and the pin being just long enough to fit in the space, will prevent its ever coming out.

While these devices are simple they certainly add to the efficiency of the motor by making such annoying troubles impossible.—Yours, etc., D. J. Percy.

Demand for Delivery Wagons

La Moille, Ill., Sept. 2.—To the Editor: I am very much interested in automobiles and have been watching for some one to make one that can be used for business as well as for pleasure—one that could be used for delivery purposes as well as light work, such as hauling another wagon behind it. As soon as they do that there will be a demand for them in the country, from butchers, bakers and milkmen, to replace horses. I find it necessary to have five horses to do my work, when, if I had something that could make 20 miles an hour instead of eight I could dispense with all of the horses. A machine to do this need not weigh a ton.—Yours, etc., E. H. Marriott.

A Question About Pressure

Cincinnati, Ohio, Sept. 1.—To the Editor: Have you not made a mistake in your reply to Mr. Morrison in last week's issue? Mr. Morrison says he "made the mistake of regulating the fire by the valve between the gasoline tank and the boiler" instead of by the valve at the burner, and from this you argue that he in effect led his gas from a small pipe into a larger one, thus reducing the pressure. As a matter of fact, would not the pressure equalize itself throughout the system?—Yours, etc., T. W. Merry.

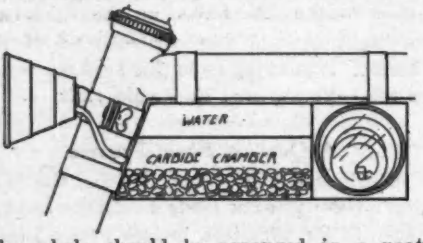
[Yes, under some circumstances; but Mr. Merry has forgotten to note that the valve at the burner was turned wide open. Had it been closed to the same extent as the one bteween the gasoline tank and the boiler the pressure would certainly have been equal, but so long as the valve at the burner was open wider than the other the pressure was reduced proportionately. For

example, if the area of the first valve opening had been, let us say for argument, one-eighth of an inch and the valve at the burner one-quarter of an inch, the pressure at the burner would have been one-quarter that shown at the gauge in the gasoline tank, less pipe friction, which would have brought it down so low as to be almost useless.—Ed.]

Who Will Make This Lamp

Paris, Tex., Aug. 25.—To the Editor: If some one will make gas lamps as per enclosed specifications and plan I will take a dozen of them and, if they give satisfaction, will replenish my stock.

The lantern body should be constructed like a tourist's collapsing cup, and when not in use is detached from the clamp attached to the frame and carried in case. The water tank A and the carbide cup B should be connected by a suitable valve and together constitute the generator. The burner is attached to the back of the lamp body with a slight protuberance, to which is attached a small piece of tubing connecting with a similar projection from the carbide chamber, thus making it readily detachable.



The whole should be arranged in a neat leather case having the size and general appearance of an ordinary tool bag.—Yours, etc., Erle K. Baker.

Ignited by Heat of Cylinder

Chicago, Aug. 31.—To the Editor: There is nothing extraordinary in the experience of Mr. Corey, related in this week's issue. His machine, apparently, was indoors and running free. Under the circumstances the cylinder would become hot in a few minutes. After the gear fell off no doubt the heat of the engine was sufficient to explode the charge. Yours, etc., T. R. W.

[There are a number of engines operated on this principle, notably that of Mietz & Weiss. It is usual, however, to place inside the cylinder some light material which will become incandescent. Engines of this character are, of course, started by electric ignition or hot tubes, which are cut out as soon as the engine has been running long enough to heat the cylinder or the material it contains.—Ed.]

Not One of Dyke's Engines

St. Louis, Mo., Sept. 20.—To the Editor.—I notice that in last week's issue you published an experience of a party in Purvis, Miss., who purchased one of the old St. Louis Gasoline Motor Co.'s engines. In your reply you state that if it is one of those "formerly made in St. Louis," etc. This would lead people to believe that about all the engines here are the same St. Louis engine. In fact, I have had people write me, stating that they saw one of my engines in their town or city, and it did not give satisfaction. The fact of the matter was, I had never sold an engine to anyone in that location, and it was one of the St. Louis Gasoline Engine Co.'s, and the parties seem to think that I was the remnant of what was left of that company.

I wish you would do me the favor of stating that I was never in any way connected with the said company, and that my engines are of different construction entirely.—Yours, etc., A. L. Dyke.

Useful Suggestions

9.—An English writer has discovered that the men who made the best times in the Paris-Bordeaux race were all among those who started early in the day. Searching for the reason he argues that "everyone knows that when the air is cold the cars travel much faster than when it is hot." His deduction is that the success of the early starters was largely due to the cool air. His theory is good, but is not always borne out by practice. Many a man has found his motor run well one day, when comparatively cool, and better the next, when a great deal hotter.

10.—My motor commenced to race and I could stop it only by turning off the gasoline. Investigation showed that the air pipe, between the foot control valve, had broken so that the engine took a full charge every time. Another time, after looking for hours to discover why my engine back fired, I found that the set screw on the rocker arm of the igniter was loose.

NEW YORK-BUFFALO ENDURANCE TEST

At 8 o'clock on Monday morning next there will start from the clubhouse of the Automobile Club of America, Fifty-eighth street and Eighth avenue, New York, the most important event ever recorded in the annals of American automobilism. The list of entries furnished by the secretary indicates that there will be about seventy-five vehicles at the start. The event will be much in the line of a procession for the first few miles, for the club will try to see to it that the laws are strictly obeyed. Later in the day there will be a scramble for the front for the privilege of the first attempt at the famous Nelson Hill.

On Saturday last the committee in charge sent out notice that the acceptance of entries would continue until the close of business on Thursday, Sept. 5, but an addition of 20 per cent will be made to the entry fee.

The list of entries up to the time originally announced for the closing was as follows:

♣

Class A.—Four-wheeled vehicles, under 1,000 pounds, in commercial running and operating condition, with all tools and supplies on board.

GASOLINE VEHICLES.

Ward, Leonard Electric Co., two entries.
Pierce, Geo. N. Co., two entries.
Scott, R. P.; Gladiator voiturette.
Baruch, Dr. H. B.; Autocar.
Duryea Power Co., phaeton.
De Dion-Bouton Motorette Co., three 5-horsepower Motorettes.

STEAM VEHICLES.

White Sewing Machine Co.
Locomobile Co. of America, three entries.
Benjamin, C. A., Locomobile.
Grout Brothers.
Geneva Automobile & Mfg. Co.

♣

Class B.—Four-wheeled motor vehicles weighing 1,000 and less than 2,000 pounds, in commercial running and operating condition, with all tools, fuel and supplies on board.

GASOLINE VEHICLES.

Haynes-Apperson Co.
Apperson, Elmer.
Stratton Motor Bicycle Co.
Dow, Alexander; Winton.
McGregor, Bradford; Winton.
Clarke, Louis; Autocar.
Owen, Percy; Winton.
Winthrop, H. Rogers; Winton.
St. Louis Motor Carriage Co.
Automobile Co. of America, three entries.
Browning, W. H.; Haynes-Apperson.
Morgan, William; Autocar.
Macnaughton, James; Gasmobile.
Searchmont Motor Co., three entries.
Electric Vehicle Co., two entries.
Field, C. J.; De Dion, 15-horsepower.
Skinner, Kenneth A.; De Dion.
Klein, M. J.; Klein runabout.

STEAM VEHICLES.

Stearns Steam Carriage Co.
Milwaukee Automobile Co.
Steam Vehicle Co. of America.
White Sewing Machine Co., three entries.
Overman Automobile Co., two entries.
American Bicycle Co.
Townsend, A. R.; A. B. C. stanhope.
Foster Automobile Co., two entries.
Locomobile Co. of America, three entries.
Lane Motor Vehicle Co.

♣

Class C.—Four-wheeled motor vehicles weighing 2,000 pounds or over, in commercial running and operating condition, with all tools, fuel and supplies on board.

GASOLINE VEHICLES.

Bishop, David Wolfe; Panhard.
Whipple, Harlan W.; Panhard.
Satterfield, John M.; Packard.
Winton, Alexander; 40-horsepower Winton.
Robinson Motor Vehicle Co.
Shattuck, A. R.; Panhard.
Greuter, Charles R.
Ohio Automoble Co., two entries.
Bostwick, Albert C.; Winton.
Browning, Henry K.; Stearns.
Vanderbilt, Wm. K., Jr.; Connstatt-Daimler.
McMurtry, A. L.; Packard.

STEAM VEHICLES.

Woodin, C. R.; Century.

♣

Class D.—Motor bicycles, motor tricycles and motor quadricycles.

Thomas, E. R., Motor Co.; Thomas motor bicycle.
Metz, C. H.; Orient motor bicycle.
Hendee Mfg. Co., Indian motor bicycle.

♣

Class E.—Delivery Wagons.

American Bicycle Co., steam truck.
Baldwin Motor Wagon Co., steam light delivery wagon.
Locomobile Co. of America, steam light delivery wagon.

THE ENDURANCE TEST.

Under the rules no manufacturer was allowed to make more than three entries for one class. There will be more than that number of machines of the same make in some of the classes, due to the entries of individuals. In each of the first three classes the vehicle must carry two persons. Details of the vehicles entered must be given the committee at a meeting on Friday of this week. Stringent rules have been adopted requiring competitors to strictly observe the rules of the road and other laws.

The event is not a race in any sense. The prizes are to be awarded to those who approach nearest to an average speed of 15 miles an hour during the whole of the journey, as shown by the times of starting and finishing the two sections of each day's run. There is no prize for any speed trial in connection with the event except the hill climbing.

The start will be made each morning at 8 o'clock. The noon controls will open at 11 a. m. and close at 3:40 p. m. Vehicles which do not arrive between those hours will not be counted as having taken part in that section of the run. The night controls will be opened at 4 and close at 9 p. m.

The machines will start each day in the order of their arrival the previous day. No vehicle which falls below an average speed of eight miles an hour for any stage of the run will be given credit for that part of the contest.

The certificates are to be awarded as follows: First class, average speed from 12 to 15 miles per hour. Second-class certificate, average speed from 10 to 12 miles per hour. Third-class certificate, average speed from 8 to 10 miles per hour.

There are some disappointing features in connection with the event. First of all, not a single electric vehicle appears on the list. This, perhaps, might have been expected, though in view of the great distances made in late trials it would have been interesting, and of far greater value so far as its influence on the public is concerned had an attempt been made to send a few electrics through this trial. Delivery wagons and heavy trucks are also conspicuous by the frailty of the entry list.

The complete route of the event, with distances, is shown in the following list:

First stage, Monday: New York to Kingsbridge, 12.9 miles; Yonkers, 17; Hastings, 21.5; Dobbs Ferry, 23; Irvington, 24.8; Tarrytown, 27.7; Scarboro, 31.6; Ossining (Sing Sing), 33.5; Croton Landing, 35.9; Oscawana, 39.4; Montrose, 41.4; Peekskill (noon control), 44.6; Annsville, 46.1; Garrison, 51.9; Cold Spring, 56; Fishkill Village, 64.8; Glenham, 67.1; Fishkill Landing, 69; Hughsonville, 75.5; Wappinger Falls, 76.9; Poughkeepsie, 84.4.

Second stage, Tuesday: Poughkeepsie, 84.4; Hyde Park, 90.7; Staatsburg, 94.8; Rhinebeck, 100.8; Red Hook, 106.3; Upper Red Hook, 109; Nevis, 111.7; Clermont, 113.5; Blue Store, 115.3; Greendale, 121.7; Hudson (noon control), 125.7; Stottville, 128.8; Stockport, 131.2; Stuyvesant Falls, 134.7; Kinderhook, 138.2; Murtzeskill, 145.1; Schodack Landing, 147.1; Castleton, 150.6; Greenbush, 153.8; Albany, 159.8.

Third stage, Wednesday: Albany, 159.8; Loudonville, 163.8; Newtonville, 165.7; Niskayuna, 171.3; Schenectady, 178; Scotia, 179.4; Hoffman Ferry, 187.2; Cranesville, 190.6; Amsterdam, 193.9; Aiken, 196.6; Tribes Hill, 199.1; Fonda (noon control), 204.3; Yosts, 210.1; Palatine Bridge, 216; Nelliston, 218.8; Palatine Church, 221.2; St. Johnsville, 224.7; Little Falls, 234.7; Herkimer, 242.

Fourth stage, Thursday: Herkimer, 242; Mohawk, 243.3; Ilion, 245.1; Frankfort, 247.4; Utica, 256.9; New Hartford, 260.6; Kirkland, 265.6; Lairdsville, 268.2; Vernon, 273.9; Sherrill, 276.6; Oneida Castle, 278.8; Oneida (noon control), 280.3; Wampsville, 283.5; Quality Hill, 287; Sullivan, 290.8; Chittenango, 291.8; Mycenae, 295.1; Fayetteville, 299.4; De Witt, 302.6; Syracuse, 307.1.

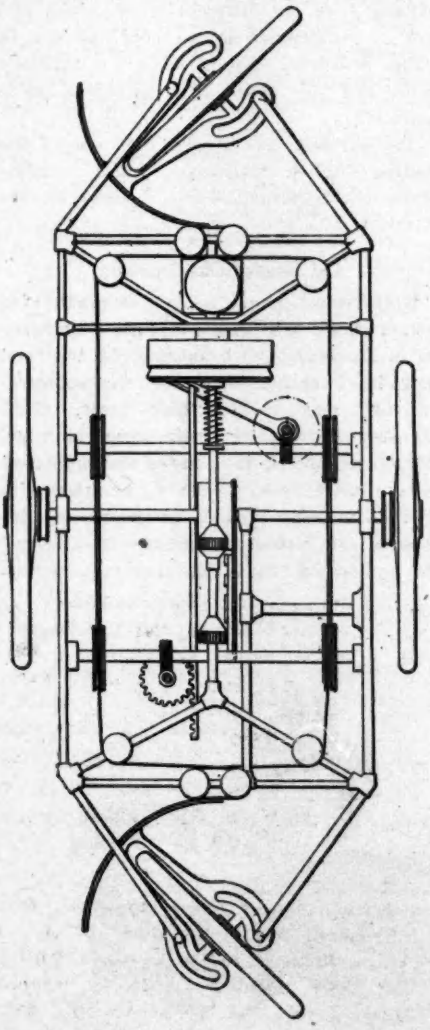
Fifth stage, Friday: Syracuse, 307.1; Fairmount, 311.7; Camillus, 315.3; Elbridge, 322.6; Weedsport, 329.9; Port Byron, 332.9; Montezuma, 338.1; Savannah, 342.6; Clyde, 348.6; Lock Berlin, 352.6; Lyons (noon control), 355.1; Newark, 364.6; East Palmyra, 368.4; Palmyra, 371.9; Macedon, 376.4; Egypt, 381.8; Pittsford, 387.8; Rochester, 394.3.

Sixth stage, Saturday: Rochester, 394.3; Gates, 398.7; North Chili, 405; Churchville, 409.1; Bergen, 412.4; Byron, 418.6; Newkirk, 423.7; Batavia (noon control), 427.7; West Batavia, 433.7; Corfu, 439.7; Crittenden, 443.7; Mill Grove, 447.2; Wilhelm, 451.2; Bowmansville, 454.2; Buffalo, 462.2.

Summary: New York to Poughkeepsie, 84.4; Poughkeepsie to Albany, 75.4; Albany to Herkimer, 82.2; Herkimer to Syracuse, 65.1; Syracuse to Rochester, 87.2; Rochester to Buffalo, 69.9; total, 464.2.

A FRENCH STEERING APPARATUS

A French engineer, rejoicing in the euphonious cognomen Henry Rene Marie Cormery, is the designer of a steering apparatus



quite distinctive in its make up. In his device the steering wheels are placed fore and aft the driving wheels, making a three-track machine, the points of contact of the wheels with the ground forming a perfect lozenge, of which the longer axis is about double the length of the shorter. The two steering wheels are so connected that they turn when steering to equal but opposite ends. To effect this object the axle at each of the steering wheels is mounted at each of its ends in two semi-circular slides, each formed with a slot concentric with that in the other. These slides are connected at the ends nearest the vehicle by a horizontal fork, which bears at its end a quadrantal sector, the periphery of which is so recessed as to form a double groove for receiving the steering chains. By a lateral movement of this fork the wheel is caused to describe a partial revolution about its vertical center, being guided by the arc-shaped grooves in the slides, in which are seated fixed tenons attached to the frame. To obtain this action two chains are used. They are indicated by a heavy line in the accompanying illustration, which is a plan view of the entire frame. These chains are mounted on two pairs of drums, the rotation of which in opposite directions is effected by crossed chains, so that the proper motion is given the steering chains to move the sectors and the attached forks and give the desired movement to the steering wheels.

In order to provide for the rotation of the drums, at the will of the operator, the shaft to which one pair is attached is supplied with a pinion meshing with a worm gear on the steering pillar, the top of which is fitted with a hand wheel as usual.

A. L. Dyke, of St. Louis, announces that he has made arrangements to manufacture his carbureters in aluminum as well as brass, thus materially reducing their weight for use in light carriages. These carbureters are made for use on from 1 to 12 and from 12 40-horsepower engines.

THE CHAINLESS CARRIAGE

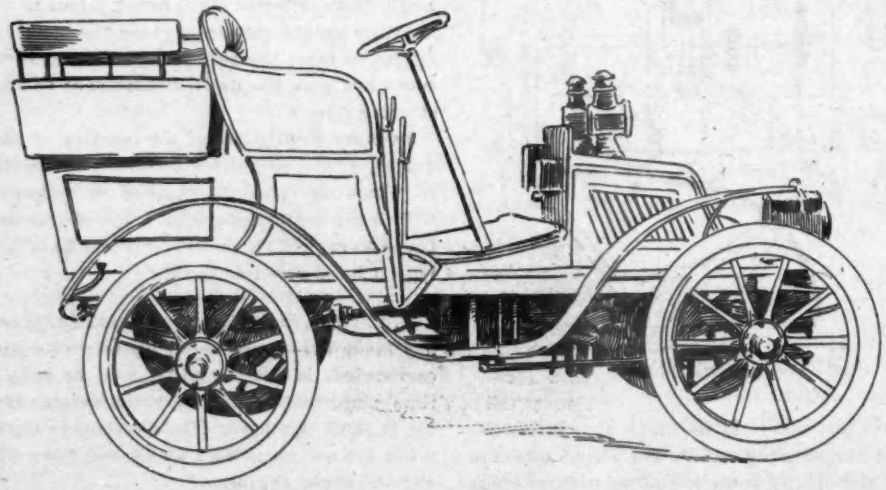
The latest introduction of French machines in England is due to W. H. Kitto, of London, who, for the last 5 years, has been one of the most thorough investigators of everything in the motor vehicle line. Last September he saw at the Paris exhibition a car which he concluded would sell readily. He ordered one and secured the agency for Great Britain. Seven months elapsed before the machine arrived, but it took very few days to attract attention. It was driven from Southampton to London, up and down the hills which there abound, on the fast speed, and, at the hill-climbing contests, promoted by the automobile club, made the ascent at the rate of 12.7 miles an hour, beating all others except Edge's racing rig and a Daimler car of twice the power, by about 5 miles an hour.

This machine is known as the Chainless and weighs 1,270 pounds. The wheelbase is long, being slightly over 6 feet 6 inches, and, as the engine and gear are low, the center of gravity is so low as to make it almost impossible to capsize the carriage. The motor is a 12-horsepower double-cylindered Buchet, with electric ignition. The cylinders are water-cooled. The change-speed gear is of the Panhard type, giving three speeds forward and one reverse, the forward speeds being 10, 20 and 30 miles per hour without advancing the ignition. The transmission is by longitudinal axle with universal joints, there being no chains. The steering is effected by the usual inclined pillar and wheel, and the change of speeds and reverse are effected by a single lever on the right of the driver's seat. The foot-brake is a strap and drum on the clutchshaft; the side wheels are also fitted with strap-and-drum brakes, operated by a lever on the right of the driver's seat. These brakes are arranged on the differential principle, and are so constructed as to hold the car in either direction. The wheels are of artillery type, and are fitted with Michelin pneumatics.

The carriage has been sold to one of the leading English companies, which contemplates the manufacture of a machine of similar design.

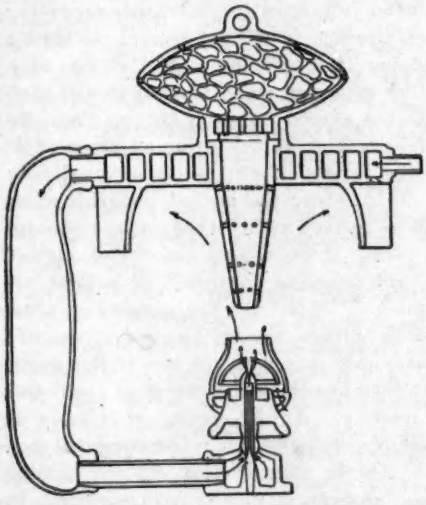
Oil Burner Development

Every development in the direction of a burner which will permit the use of kerosene oil in connection with automobiles will and should be watched with the greatest interest by their makers and users. That the successful burner will come, in time, there is no doubt. It is one of the important factors in the development of the automobile of the future to which designers and inventors are giving attention. In England the makers of the Clarkson burner tell us

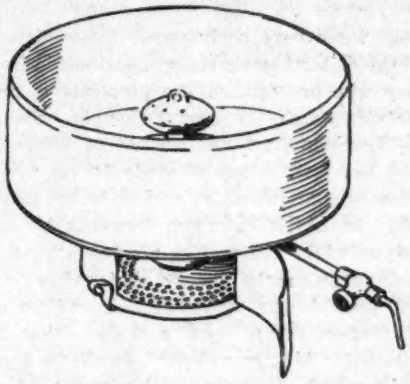


that they have reached commercial success, that their burner gives satisfaction and operates at small cost. The same burner was tried in this country and failed to show the success the makers claim for it.

Down in Bridgeport, Conn., a place where many good things in the line of lamps and other devices which burn kerosene originated, the Liquid Fuel Engineering Co. claims to have been making, for the last two years, an oil burner which meets the requirements of the automobilist. If the claim can be verified it is a pity the makers have so long hidden their light. The burner has been on the market, for other purposes, a number of years. It is made in a great many sizes and for as many purposes. No air pressure is necessary. The gas is generated by the passage of the oil through a retort, so con-



structed that the oil has a long travel from the time it enters until it leaves, and so placed that it is in contact with the hottest part of the flame. The burner outlet, is provided with a loosely-weighted rotary valve. This is revolved by the force of the vapor rushing from the retort and serves the double purpose of keeping the outlet free



from carborn deposit and of mixing with the vapor a sufficient quantity of air to insure proper combustion. After passing through the valve the vapor is carried upward and under the generator, producing a circular flame of great intensity.

One of the most important features of this burner is the method of self re-igniting. The device is exceedingly simple. A hollow combustion chamber, filled with cracked fire brick, has a tapered tube passing through the center of the generator, through which a part of the burning vapor passes. In a short time the fire brick becomes heated and will hold its heat for a long time after the fire becomes extinguished. The first escaping vapor that leaves the outlet of the burner pases up into the taper tube and thus into the fire brick, where it becomes ignited, exploding down the tube to the source of the escaping vapor. Tests of this part of the device have been made and the burners have been reignited 15 minutes after the fire had been extinguished.

THE DESIGN OF THE MOTOR BICYCLE

In these very early days of the history of the motor bicycle every contribution by a man who has studied the problems it presents is worthy of careful thought. Douglas Leechman, an English patent attorney, who has given years of study to the cycle, recently contributed an article to the Autocar. In his introductory remarks he discusses briefly the matter of general design and advances the theory that, while, for the present, the motor bicycle will be an adaptation rather than a design—that is, the safety bicycle will be followed in form and method of steering and a motor added to it—a much more efficient and satisfactory machine might be evolved by abandoning old styles of construction, and by starting at the beginning to design something new, keeping in view the greatly altered requirements of the motocycle. The vital features in a motor bicycle are the position of the motor and which wheel it drives. These affect more than anything else the questions of balance in general, and steering and side-slip in particular. The balance of a bicycle is in certain respects essentially different from the liability to upset of a vehicle supported on three or more wheels. A bicycle is balanced by a series of lateral movements effected by steering, which continually check the tendencies to fall by bringing the line of support back under the center of gravity. If these lateral movements be not effected quickly enough the rider will fall; and the higher the center of gravity the easier the balance is, because the rider has more time in which to make the lateral movements. The action is in this particular similar to that of a pendulum—the longer the wire the slower the movement of the weight. The bicycle is like a pendulum, but inverted, and the higher the center of gravity the slower the lateral movement of the weight; and hence, as stated, the more times the rider has to correct his variations from the true path. So long as the center of gravity remains within the wheelbase he need not trouble about it. The lower the center of gravity, the greater is the force required to throw it out of the base area; but there is no base area worth mentioning in a bicycle, only a base line.

If a rider were mounted on a bicycle correctly in track, and otherwise accurate, and could keep his center of gravity exactly over his base line without any lateral deflections, and maintain his straight and upright course over a perfectly flat surface, he need have no fear of side-slip, be that surface never so greasy. Unfortunately, these ideal conditions do not commonly prevail in real life, and the possibility of side-slip must be considered. A high center of gravity is valuable in this matter, but indirectly rather than directly: it will not prevent the bicycle slipping if it gets on, say, the side of a hollow in greasy macadam, but it will mitigate the effects. Thus if the machine slip sideways 2 in. it will make an angle of 4° to the vertical if the center of gravity be at 30 in. above the ground, but this angle will be reduced to 2½° if the center of gravity be raised 12 in. higher, and the chances of the rider coming down will be reduced accordingly. Not only the disturbing effect on the balance, but the chances of the slip continuing, vary with the size of this angle, and therefore with the height of the center of gravity. A high center of gravity is therefore valuable in facilitating balance, and also in counteracting side-slip arising from unevenness in the road surface. In the case of an ordinary safety bicycle and rider, the center of gravity may be taken at about 2 in. above the peak of the saddle (fig. 12). If the bicycle be built heavier for motor purposes, as it should be, the center of gravity may be brought down 1 in. Wherever the motor is put it is almost sure to lower the center of gravity, as the engine, and especially the fly-wheels thereof, cannot conveniently be mounted as high as the saddle. To maintain the existing conditions as far as possible, therefore, the frame of the machine should be built higher from the ground than usual, and the motor should be arranged high on the frame. In figs. 1-11 *g* represents the center of gravity with a bicycle weighing 40 lbs., rider 140

lbs. and motor and appurtenances 40 lbs. The motor itself is taken at 30 lbs. (with 20 lbs. fly-wheels), and the appurtenances at 10 lbs. Some motors are, of course, lighter, but their power is not, I think, such as will long satisfy the rider who wants his machine to take him up-hill as well as along the level and to last a reasonable time.

Adding the motor to the bicycle affects the balance in another way, namely, by increasing the centrifugal force acting on the bicycle when the corners and other curves are being negotiated.

The centrifugal force developed in negotiating an ordinary corner at high, or even moderate speed, becomes a matter for serious consideration and as calculated by the generally accepted formulas is about as follows: With a rider of 150 pounds on an ordinary bicycle of the modern type weighing 20 pounds, traveling at 15 miles per hour around a curve with 100 feet radius the centrifugal force will be 25½ pounds. With a motor bicycle weighing 100 pounds under the same conditions this would be increased to 37½ pounds, and if the rider so far defied the law as to run the machine at 30 miles per hour it would mount up to 153½ pounds.

The centrifugal force acts horizontally and must be counteracted by the leaning in of the rider and machine. The necessary inclination may be most easily realized when shown diagrammatically. The three conditions above mentioned are shown in the diagram at figs. 1, 2 and 3, respectively. In each case W I is proportionate to the weight, C W to the centrifugal force and the angle W I C shows the angle at which the rider will have to lean in to get around the curve.

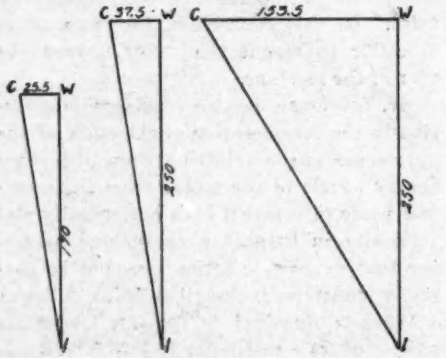
It will be observed that the height of the center of gravity does not enter into this calculation, so that the machine is neither better nor worse in this particular connection because of the presence or location of the motor so far as it affects the height of the gravital center. It will also be noticed that altering the weight alone does not alter the angle; the heavier machine leans over neither more nor less than the lighter one at the same speed, but as the speed rises the width of the angle and the chances of side slip increase very rapidly. Though the height of the center of gravity does not affect this calculation its longitudinal position may have a material bearing on the rider's safety. If it be moved forward or backward the chances of the front or rear wheel slipping will be affected proportionately as the centrifugal force may be reckoned as concentrated on the center of gravity.

While there is no extraordinary difference of opinion as to whether front or rear wheel slips are the most common and the most serious in their results it may be safely stated that while the rear wheel may slide to a considerable degree without involving an involuntary dismount, even a slight slip of the front wheel is generally fatal. In this connection, therefore, it is desirable to mount the motor toward the rear of the machine.

Mr. Leechman devotes considerable attention to the consideration of the effect of the gyroscopic action resulting from displacing the fly-wheels of the motor from their normal plane of rotation both horizontally and vertically in turning a curve, and assuming that gyroscopic action may not be generally understood, describes it as follows:

When a fly-wheel is rotating about its axis it offers a resistance to any force tending to disturb the direction of its axis. So long as the axis is only moved either exactly lengthwise, or in such a way as to keep parallel to its original position (as when a motor bicycle is traveling in a straight line), this resistance does not show itself, but directly an attempt is made to move the axis of the fly-wheel about a fixed center (as in riding round a corner), the "persistence of the plane of rotation," as it is called, at once asserts itself. If the force applied be sufficient to overcome this resistance or persistence, the axis will move but in a direction at right angles to the direction of the force. This is the gyroscopic action, and in connection therewith the following rule may be usefully remembered: When a fly-wheel rotating about its axis is turned about another axis, the wheel axis tends to set itself parallel to the other axis, with the fly-wheel rotating in the same sense as the movement about the said other axis. As this may be more concise than clear, some illustrations pertinent to the subject may be taken. Suppose the fly-wheels of the motor on a bicycle are mounted on a horizontal, transverse axis

(as they almost always are), and that the fly-wheels are rotating in the direction in which the bicycle is traveling, that is, with the upper parts of the wheels moving forward. The rider, after traveling straight ahead, makes a turn to the right; consequently the axis of the fly-wheels is turned in a horizontal plane about a new axis, which passes vertically through the center of the curve on which the rider is traveling, and the axis of the fly-wheels will therefore try to get into a vertical position. But which end will try to rise and which to fall? The right-hand end will tend to rise, and the left to fall, because then the fly-wheels



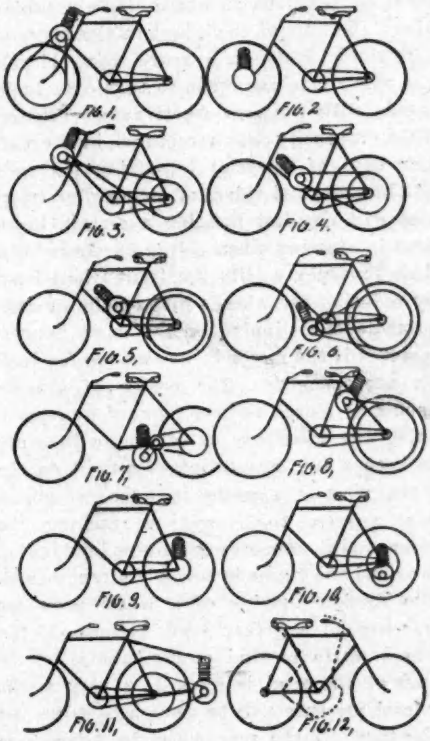
would rotate to the right or "clock-wise." This tendency to tip on the part of the fly-wheel axis is, of course, transmitted to the motor and the whole machine, and as it helps to incline the machine outward it must be resisted by the rider leaning in to a sufficiently greater degree. If the fly-wheels were revolved in the opposite direction the gyroscopic action would tend to incline the machine inward under similar circumstances, and the rider would have to lean in to a less degree. As it happens, the gyroscopic action, so far as deflections to right and left are concerned, is so small that it does not matter, in this connection, in which direction the motor is run.

The amount of lean, more or less than would be required under ordinary circumstances, is found by certain formulas which we omit through lack of space, in the case of fly-wheels weighing 20 pounds at 1,500 revolutions a minute on a curve with a radius of 100 feet, to be .13 inch, which can hardly be considered material, though the amount will be increased and revolve more rapidly, more particularly the latter. Thus, with fly-wheels weighing 35 pounds having a radius gyration of 3.5 inches and revolving at 2,000 per minute, which would so increase the weight of the motor that the weight of the machine and rider would be at least 235 pounds, the increase of lean would be 1,032.

But in turning to right or left the rider and machine lean over, and this leaning over also sets up a gyroscopic action in the fly-wheels, and gives an opportunity for another illustration of the rule. Suppose the fly-wheels are rotating backward. The rider leans over to the left (contra-clockwise) to make a turn to the left. The leaning movement takes place about the base line as center, and the axis of the fly-wheels is consequently turned in a vertical plane about this line as a new axis. The base line axis being longitudinal of the machine, the axis of the fly-wheels will endeavor to move horizontally into a direction also longitudinal of the machine, and as the leaning-over movement is contra-clockwise, the left end of the fly-wheels' axis will endeavor to move forward, and as the right end will endeavor to move backward, as this would bring the direction of the rotation of the fly-wheels also contra-clockwise. Now, as the radius of the curve is in this case very short, say 3 feet from the base line to the center of gravity, the gyroscopic effect is much greater than that previously considered, and becomes by no means a negligible force considered as a disturbing influence, and its effect greatly depends upon the position of the motor. If the motor (still running backwards) be mounted on the steering fork, where the fly-wheel axis is about 1-3 foot in front of the steering axis, there will be an internal force of nearly 240 pounds resisting the deflection of the front wheel in steering. If, on the other hand, the fly-wheels revolve in the same direction as the machine is traveling, this force of 240 pounds will facilitate the deflection of the steering wheel; and doubtless this is the better way for the motor to run under these particular conditions. The force is not quite as much as 240 pounds, because the steering axis, not being vertical and not passing through the point of contact between the front wheel and the ground, a small part of the force takes effect laterally on the rear wheel, but it is very small. There are also other details which influence the calculations somewhat, but they are

neglected for the sake of clearness and brevity. The effects would be much the same in fig. 2 as in fig. 1, but in fig. 3 they will be distributed and influence both the steering and side-slip. Here the motor, though occupying the same position as in fig. 1, is fixed to the head socket of the rear frame, and there will be a lateral pressure at the point of contact between the rear wheel and the ground of about 7.27 pounds, and at the steering axis 72.72 pounds. The steering axis being about 3 in. in front of the point of contact between the steering wheel and the ground, there will be a force of 20 pounds, tending to turn the steering wheel in the direction in which the gyroscopic force acts. Thus, if the motor in fig. 3 be run in the direction of travel, when the rider leans over the tendency of the back wheel to side-slip will be somewhat increased, and the deflection of the steering wheel will be resisted, but if the motor be run in the direction illustrated, the gyroscopic action will help the ground friction in resisting side-slip of the rear wheel arising from centrifugal force, and the deflection of the steering wheel will be facilitated.

Where the motor is set further back, between the steering axis and the rear wheel axis, as in figs. 4 to 8, the lateral pressure on the rear point of contact will be increased, and that on the steering axis will be reversed, so that by running the motor backwards the tendency of the rear wheel to side-slip in rounding curves is materially reduced, but the steering is rendered more difficult, as the forward part of the rear frame being forced outward, the steering wheel is also subjected to a force tending to turn it outward. With the motor arranged in the vertical plane of the rear wheel axis, as in figs. 9 and 10, the lateral pressure on the rear wheel will be exerted to the full, while the steering will be comparatively little interfered with. When the motor is carried out behind the rear wheel (fig. 11) the gyroscopic action has its effect on the rear wheel reversed, while the effect on the front of the main frame, and hence on the steering, is the same in direction, though less in quantity, as in other cases where the motor is located behind the steering axis, so that side-slip and ease of steering will both be helped by running the motor the same way as the road wheels. It will be obvious, therefore, that if the gyroscopic action is to be employed (1) in diminishing the risks of side-slip by being set off against the centrifugal force acting upon the rear wheel, and (2) in facilitating steering by urging the steering wheel to deflect to the side on which the rider leans over—to attain both these results at the same time the motor must be located either forward of the steering axis or behind the rear wheel axis. This is supposing that the steering axis lies, as usual, in front of the point of contact; if it were arranged behind the point of contact both advantages could be obtained with a motor located between the axes mentioned, if the fly-wheels were run backwards. As the gyroscopic force now being considered is seemingly greater than the forces brought into play in riding a safety bicycle, "hands off," it is quite possible a motor bicycle might be run satisfactorily if constructed with anti-caster steering.



The gyroscopic action set up in rounding a curve continues until the rider resumes a straight course, but the gyroscopic action set up by leaning in is only felt at the mo-

ment when the rider leans in, and the reaction when he gets upright again.

To prevent a wheel side-slipping, there must be sufficient friction between the tire and road surface to prevent lateral movement. This friction depends partly on the character of the road surface and partly on the weight carried by the wheel. When a force is employed in rotating a wheel in a machine the resistance the wheel offers to rotation tends to turn the whole machine about the axis of the wheel in the opposite direction. Thus, in a rear-driving bicycle the whole machine tends to turn over backwards with the rear wheel axle as center. This propensity was recognized in the earlier days of tricycles by fitting tilt rods at the back, and riders of some motor tricycles will recollect noticing a certain looseness in steering when riding up steep hills. This tendency to lift the front wheel may, by reducing the wheel's grip on the ground, promote side-slipping of the more dangerous sort if the motor be located too far back on the machine. The center of gravity should be moved further forward by lengthening the wheelbase or otherwise in order to keep a fair proportion of weight on the front wheel. Lengthening the wheelbase also reduces the vibration reaching the rider, and it promotes steadiness in running, provided the frame is suitably strengthened. Too forcible driving of a wheel promotes side-slip on a greasy road, because, if the wheel starts to skid circumferentially, its grip of the road being lost, a very slight lateral pressure will be enough to cause the side-slip. If the rear wheel be driven one generally gets one or two premonitory slides, and is able to slacken speed before anything serious happens, but if the front wheel be the driver the rear will trail meekly in line until its leader slips and there is a sudden fall. The momentum of the mass tends to exaggerate any lateral movement of the steering wheel as a whole by endeavoring to push by it. Too severe braking of the front wheel favors the same result for a similar reason.

Though one cannot but admire the ingenuity displayed in some of the small motors on the market, neither much power nor great durability can be expected from a motor which is narrow enough for the inner faces of the pedal cranks to clear it, and to get an engine worthy of the name it should be of such a width that it will have to be out of the paths of the rider's legs. This excludes the motor from any position within the dotted line in Fig. 12.

A safety bicycle is not particularly well adapted to the carrying of luggage, and the position for mounting a burden as heavy as a motor should be very carefully considered. The wheel centers are directly supported from the ground, but the front fork should be greatly reinforced if it is to drag the machine and rider. The bottom bracket is specially supported for sustaining heavy vertical pressures, and the saddle-pillar lug, or apex of the rear triangle, is, of course, the part of the machine designed to carry the weight of the ordinary motor, that is, the rider. The other motor may well be suspended from the same point.

Motor bicycles have been fitted with water cooling, but air-cooling is more suitable for this class of automobile. The speed at which the machine runs will assist in preventing over-heating, but a position should be chosen for the motor in which it will be exposed to a fair draught, and in which it will not burn the rider. The parts of the motor should be readily accessible. The central plane of the motor should coincide, as nearly as possible, with the central plane of the whole machine. The valves should work vertically, though it must be confessed they give wonderfully good results when moving at a quite considerable angle.

While we do not entirely agree with some of the points made in Mr. Leechman's article, particularly that of excluding the motor from the position shown in Fig. 12, the author must be credited with having given careful attention to the subject and with having disclosed much of deep interest to those concerned in the manufacture and development of the motor-bicycle. There are several features wherein the motor-cycle of American design is not as seriously affected as are those of European construction. For instance, in the matter of gyroscopic effect Mr. Leechman's conclusions are derived from calculations based on a motor with 35-pound fly-wheels running at a speed of 2,-

000 revolutions per minute, which is, to say the least, a rare condition in motor-cycles of American construction. There are some machines fitted with motors running up to the speed mentioned, but the fly-wheels are seldom over half the weight of those taken into consideration by Mr. Leechman. In those machines fitted with the larger class of motors the speed is far below that assumed. In fact, in one machine of this class, the gear of the motor to the driving-wheel is even less than four to one.

A point which, it would appear, is worthy of more consideration by the manufacturer than the question of gyroscopic effect, is the matter of frame construction. The writer is daily using a motor-bicycle, fitted with the heavier class of motor, and has ridden it hands off and almost the entire range of speed within its capacity, both on the track and on the road. He has had no trouble in negotiating any curve that could safely be undertaken, under similar conditions, on the ordinary bicycle. In the matter of strength, however, there is still much to be learned. The idea of attaching a motor and accessories to any ordinary roadster is preposterous, though it is taking some of the manufacturers a long time to realize the strength required in the frame and all its parts before absolute safety is attained. In some cases the builders are taking long chances in this respect. For instance, we are aware of one case wherein a motor-cycle was delivered to its user with the assurance that the front fork sides were of extra heavy seamless steel tubing reinforced practically their full length, but after an accident necessitating the replacement of one of the fork sides, it was found that the original one was a common pattern of brazed fork side, of ordinary weight, fitted with only the fish-mouth reinforcement used in regular roadsters. The accident mentioned was one that would have probably demolished any fork side, however strong and well constructed, but the manufacturers were taking a long chance in delivering to the rider a fork of the type mentioned.

R. L. Francis Co., Marquette, Mich., will pay a reward for information leading to the recovery of two stolen bicycles, as follows: Orient, 24-in. frame, enameled black, No. 31,687, Morrow coaster hub in rear wheel, Hartford tire on rear wheel, Goodrich on front; traced to Chicago; taken by a colored man giving name of William Jones; heavy set, dark, about 19 years. Featherstone chainless, 22-in. frame, black, No. 576,-405, Dunlop tires.

R. Sumi & Co., of Osaka, Japan, who have a branch in Toronto and have done considerable business with American makers of bicycles, write that Mr. Sumi will leave Japan about the middle of August and will call on the trade in this country about the middle of September. This gentleman was in this country on a purchasing trip about a year ago.

South Bend, Ind., has a bicycle lamp ordinance. The dealers and riders of that city believe it should be repealed and will make an effort to induce the city authorities to "take it back."

A FORM OF REPORT ADOPTED BY THE

BUFFALO AUTOMOBILE CLUB

For the Use of Its Members, in an Endeavor to Secure Information Relative to Roads and Other Matters of Interest and Value to Tourists.

BUFFALO, N. Y., ..., 190..

Report of.....

Left .....via ..... Street,

at ....., arrived at ..... at .....

This piece of road is good ..... fair..... bad .....

I believe this to be the best route between these points (if not state why).

.....

The Grades are .....

Distance ..... ascertained by .....

Scenery ..... General remarks on road .....

.....

The Town of .....has telegraph ....., telephone?

(in hotel)? ..... Railroad .....

Ferry or Steamboat connections with .....

The best Hotel is .....

Rates approximately .....

Gasolene can be had at ..... on week days, and on Sunday at .....

..... have offered

to supply a continuous electric current of..... volts .....

amperes maximum, between the hours of..... and ..... at

a rate of ..... cents per ordinary vehicle, charged, and are willing to make arrangements to that effect with this Club. The best place for repairs to vehicle, etc., is .....

Places worthy of a visit in this town are.....

.....

Automobiles may be stored over night at.....

.....

Remarks: (including names of several villages passed through to indicate route taken) .....

.....

.....

.....

CYCLE SPORT AND TRADE

The wide-awake dealer may generally find some method of keeping himself before the public other than the prosaic newspaper advertisement which, while it does all the good expected of it, creates no great amount of interest in the advertiser unless backed by something which will be recalled to the mind of the reader. Harry Geer is a sample of the wide-awake dealer, even if he does live in St. Louis. The aversion of the residents of that city to anything bordering on speed is proverbial; in consequence of which a ridiculous limit has been set on the speed of automobiles, and now the papers clamor for a reduction in the speed of the trolley cars. One of the papers desired to ascertain the speed at which the cars travel and Geer, with a motor tricycle of his own construction, was promptly on hand to volunteer to make the test. Starting at 7 o'clock in the morning and following one of the cars he found that he had all he could do to keep up with it and that it moved at times at something like 36 miles an hour. Meanwhile, where were the police?

Geer writes that he has found it profitable to keep his business constantly before the public, and he considered this an excellent opportunity to secure some cheap advertising. He certainly secured it, for the papers gave the choicest position on the front page, with a four-column head line, to the incident. "We have just celebrated the 300th sale of our $25 Geercycle," says the St. Louis dealer, "and considering the fact that a majority of bicycle men are complaining about the decline of the business we believe this to be an excellent record. To verify the number of sales write to Norvell-Shapleigh Hardware Co.

To Make Wood Rims in France

For three years or more there have been rumors that a wood-rim plant would be installed in France by Americans. W. W. Stall was there in 1898 and expected the enterprise would be started at once. Then came the changes in the affairs of the companies, which possibly upset all the plans. The work is to be done at last, however. In a letter to this paper Secretary Wilcox, of the American Wood Rim Co., says that President Bailey has returned from Europe after perfecting the formation of the Cie Franco-Americaine des Jantes en Bois, which company will operate factories near Paris as a branch of the American Wood Rim Co., manufacturing the Kundtz, Plymouth, Lobdell, Fairbanks and Boston wood rims and guards suited for all types of European tires for bicycles and light vehicles using pneumatic wire wheels. This factory will be equipped with the most modern devices and facilities and the high quality which has served to popularize the company's rims will be maintained both with respect to material and workmanship. The American company will send experts from the American factories to supervise the manufacturing departments in the French factory, and American manufacturers of bicycles who are sending their products abroad are assured of protection in Europe under the guarantee of the American company.

George R. Ostheimer has been selected as managing director of the company's affairs in Europe, and business offices have been opened at 41 Rue de l'Echiquier. The factories will be in position to commence deliveries on European business in December, and a number of the largest European manufacturers, including M. Clement and M. Peugeot, have placed contracts for 1902, negotiations being now in progress which it is hoped will result in a volume of business sufficient to keep the new factory going to its full capacity. Additional factories are on the ground to admit of immediately increasing the capacity to 5,000 rims and guards

per day, if necessary, and the fact that the two principal manufacturers above referred to have decided to make wood rims a feature of their 1902 models is sufficient to insure the ultimate popularity of wood rims on the continent and justifies the opinion that wood rims in Europe will eventually supplant steel rims for bicycles and wire wheel vehicles as they already have in America. Mr. Lobdell, vice president of the company, leaves for Europe in September to direct the installation of the machinery and put the factory in modern working order.

The same guarantee which covers rims in this country will be observed by the European branch so that manufacturers shipping wheels abroad will be protected in Europe.

The Paris-Brest Race

Details of the Paris-Brest-Paris bicycle road race, run on August 16, and following days have been received. Everything indicates that the event created as much excitement as the automobile race between the French and the German capitals. The press extras were as numerous as on the occasion of a presidential election. Out of 214 entered, 140 riders started. The best known were Huret, Rivierre, Garin, Lesna, Aucouturier, Frederick and Miller. One of the principal reasons the race was followed with such excitement is that it was a fight between some the leading bicycle concerns of the world. The American Bicycle Co.'s team was composed of Lesna and Miller, on Clevelands, and Aucouturier and Fisher on Crescents. The Acatene company had Rivierre and Frederick; La Francaise, one of the oldest French bicycle firms, had Huret, Garin and L. Kuhling.

The start occurred at 4:53 on Friday morning. Lesna, Gougoltz, Aucouturier and Chevalier, after having covered the Longchamps course, equal to about 2¼ miles, had a lead of almost 50 meters. Along the roads large crowds were standing, although it was early morning. The pacing was confined to bicycles, and it may be easily imagined what a large number of pacemakers were needed. All of the big men had one or two automobiles following them, loaded with exchange machines, provisions and pacemakers. Before 20 kilometers were run Gougoltz gave up and was engaged as pacemaker for Lesna. The latter got rid of Chevalier soon after and had but Aucouturier as companion. Near Verneuil (115 kilometers) this rider had a puncture. At Alencon (190 kilometers) Lesna was 20 minutes ahead; at Lavel nearly 35 minutes, at Rennes (351) exactly one hour. Nothing extraordinary happened up to Brest, where Lesna arrived at 3:07 on the following morning, having covered the distance of 598 kilometers in 22 hours 15 minutes, an average of 27 kilometers 897 to the hour. The plucky Swiss will never forget the ovation. One hour and 56 minutes after Lesna's arrival Aucouturier and Garin arrived together, followed by Fisher at 55 minutes; Rivierre and Frederick came 10 minutes later. Miller appeared in half an hour, complaining that he had to ride many miles without pacemakers. Huret had given up several hours out of Brest.

On the way back to Paris the real struggle started. At Morlaix, 62 kilometers out from Brest, Lesna passed almost 2 hours ahead of Garin, who had run away from Aucouturier. At Lamballe (765 kilometers) Lesna passed with only a close one and one-half hours ahead. Garin was going splendidly. Rennes (849 kilometers) was reached by Lesna at 3:25, while Garin made his appearance at 4:20, having gained 51 minutes over a course of 84 kilometers. Huret placed all his pacemakers at Garin's service. At Vitre (881 kilometers), Lesna was but 19 minutes ahead, and when he heard of it it affected him seriously. About 2 hours later Rivierre and Aucouturier arrived together, followed by Miller. At Laval Lesna passed at 7:12:22, while Garin passed less than 7 minutes later. At Mayenne (943 kilometers) nearly 4,000 people crowded near the controle. Lesna had hardly departed when Garin rushed in. His condition was superb, while Lesna was quite fatigued. At Pre-en-Pail (981) Garin passed first nearly an hour ahead of Lesna, who was in a precarious condition. He was tired and his knees were swollen and hurt him. For nearly 20 kilometers the courageous rider prevented Garin passing. Even over a hill 2 kilometers long he kept the lead, but after it had been covered he weakened suddenly and Garin gave the order to his pacemakers to go. Lesna fell off his machine. Although Garin fell several times he did not hurt himself badly, and made his

appearance on the Princes track, the end of the race, at 9:04:01 in the morning, having covered the distance of nearly 1,200 kilometers in 52:11:01. Less than 2 hours passed when trumpets announced Rivierre. He was in much better condition than Garin. He covered his last kilometer in 1:47. The trumpets again sounded and two riders were seen. They were Aucouturier and Frederick, separated by hardly 30 meters. Aucouturier finally won by 10 meters. When Miller finally arrived he was greeted with loud cheers. He covered his kilometer in the splendid time of 1:25 and showed no signs of fatigue. "I am sure I would beat them all if the race would continue another 24 hours," he said. And this was the opinion of all who saw him. Had he had the good service some of the other fellows had it is not unlikely that he would have been among the first two.

An admirer of Lesna sent a 100 franc note to the Velo and proposed to open a public subscription. In two days the Velo had received $80. The day after its rival, the Auto-Velo, opened a subscription, which attained $275. There is much comment in Paris over the action of the Auto-Velo and the incident goes to show how bitter is the rivalry between the two papers.

Taylore Returns to Paris

New York, Aug. 31.—Edouard Taylore, probably the fastest pace-follower in Europe, returned to France on Wednesday. The young Parisian's visits to this country have been uniformly unlucky. In his first visit he had poor pace and unlucky falls. On his second visit he was not here long enough to get acclimated, and this time malaria, contracted in Buenos Ayres last winter, developed and rendered him unfit to do himself justice. Before his departure this spring he had defeated the best pace follower in Europe at Paris.

Michael will probably go to Paris this autumn and ride three races at the Parc des Princes.

Brady is talking of sending a team of pace-followers and sprinters to Australia this winter.

Elkes Again the King

New York, Sept. 1.—In an hour race at Manhattan Beach yesterday against Walthour and Stinson so far as one race could settle it Elkes resumed his premier position. He did it in such a signal manner, however, that should paced racing stop for the season with this race there would be few to deny him the championship.

Elkes' reverses the past month and the hailing of Walthour as the new champion are fresh history. There were many to believe that Elkes still suffered from his fall and was not in his true form when Walthour beat him at the beach. So much faster and stronger did he go yesterday that Walthour's victory must be credited solely to the champion's temporary lapse of form. It was said yesterday that Walthour was not feeling well and was not up to form. He, however, rode as fast as his "best ever," but that was not near fast enough to win against Elkes, who beat him four and three-quarter laps, made more miles than ever before scored in a competition in an hour, and despite a threatening, blustering day beat the track record for 36, 37 and 38 miles and the hour. Stinson set a terrific pace up to 10 miles, and then fell back beaten, though his grit kept him in the race to the end, where he was a mile and a half behind Elkes and a lap and three-quarters behind Walthour. After 10 miles Elkes began a regular runaway and led by 75 yards at 11 miles. In this mile Walthour passed Stinson. In the 20th mile Elkes lapped Walthour and passed Stinson the second time. Walthour was lapped again in the 26th, 30th and 35th miles. Stinson lost a lap in the 24th mile through a broken chain.

Elkes scored 38 miles 575 yards in the hour, which is world's competition record. It was undoubtedly the greatest ride ever made behind pace, considering the unfavorable wind and weather conditions.

Two amateur events preceded the big race. Champion Hurley won the two-thirds open in the usual finely drawn finish, with Bedell second and Billington third. De Palma (210) won the 2-mile handicap in 4:25 2-5, with Bedell (60) second and Gus Welsing (30) third. John Ruel rode an exhibition on an Orient motor bicycle, covering two miles in 3:09 1-5.

The Antwerp Grand Prix

Antwerp, Aug. 13.—The three days' meet ended tonight in the only city in this populous country where good racing is yet alive. The championship of Antwerp was

won by Richardson. Then came the amateur and professional championships of Belgium. The first named was won by Darcy. In the professional class Grogna, Broka, Vanden Born and Deleu won their heats. In the final Broka tried a runaway without success. A little later Vanden Born jumped, gaining two lengths. Grogna went after him, caught him 10 yards from the finish and won. The match between the champions of the two classes was easily won by the professional.

The event of the day was the one-hour race between Dickentmann, Bouhours and Robl. This was won by Dickentmann, who covered 59 kilometers, 720 meters, breaking the Belgian record.

On the second day of the meet the principal event was the Great Prix of the east. The semi-finals were won by Jacquelin, Vanden Born and Momo, who contested in the final. In the final the pace was so slow that the band played Chopin's funeral march. Just before the bell Vanden Born jumped and in a second had two lengths, but by some unaccountable error the Belgian ran so wide that it enabled Jacquelin to make up the gap and win by a few inches. Momo was not dangerous. The tandem race was won by Gougoltz and Jue from Conelli and Gentel and Jacquelin and Grogna.

On the last day, in the Great Prize of Antwerp, Jacquelin, Conelli and Mulder, who were in the second heat, agreed that in the event of either sustaining a puncture they were to run the race over. After about 300 meters had been run Jacquelin suddenly slowed up and Conelli did the same, while Mulder continued. Near the riders' quarters Jacquelin, followed by Conelli, dismounted and claimed that one of his hubs was out of order. The referees decided that the race was regular, Mulder claiming that the accident did not come under the agreement. In the final Vanden Born jumped to the lead soon after the bell and won from Momo by a half length.

Taylor as a Pace Follower

New York, Aug. 31.—From a critical standpoint it was a foolish play to take Taylor out of his sprinting class and put him against such a crack pace-follower as Michael, and on such a little bowl of a ten-lap track as Madison Square Garden and expect the colored crack to do other than suffer by comparison. But the great public, for the most part as yet uneducated in cycle racing, is ready to go wild over just such an impossible proposition, and in proof of this 6,000 people turned out last night to see the race. The major was, of course, beaten; but he showed how good an all-around performer he is.

The match was best two in three at 1, 3 and 5 miles, behind motor pace. The first heat was at a mile. Michael had the pole and negotiated the little bowl with precision. He quickly shot into the lead. Taylor seemed afraid or unable to get close to his pace and rode from a yard to two yards behind it. Michael rode the mile in 1:34 2-5. Taylor followed his pace much better in the second heat, which was changed from 3 to 2 miles, and Michael rode in 3:10 3-5 and beat the indoor record.

Henri Fournier gave a mile exhibition ride on a single motor bicycle in 1:38 and received a great welcome.

Lawson Continues to Win

Boston, Mass., Aug. 31.—Lawson won the half-mile championship race at Revere Beach this morning, running away from Fenn in the final sprint. In the grand semi-finals Kramer was beaten by Lawson and Collett by Fenn. Hardy Downing won the 2.10 mile in 2.10, with Bowler second and Hugh MacLean third. The mile handicap fell to Bleecher (150) in 2:03, McFarland (45), second, Wilson (55) third, Taylor (scratch) fourth.

Meiselbach's Creation to Close

And still another. The American Bicycle Co. has arranged to close the Milwaukee factory, a combination of the old Meiselbach concern and two others, amalgamated with it at the time of the organization of the combine. The machinery is being prepared for shipment. It is said that 600 men will be thrown out of employment. George Bowler, the Cleveland machinery man, who has purchased so much of the A. B. C. machinery, has been in Milwaukee, examined the plant and has probably bought most of it.

The factory was started about 8 years ago and A. D. Meiselbach operated it on a small scale until about 5 years ago. He then built a large addition to it and from that time until 2 years ago manufactured more wheels

there in one year than any other bicycle factory in the country. He amassed a fortune and the American Bicycle Co. offered him a big price for it. He sold out, receiving considerable cash. S. Wollheim was manager of the plant, but he resigned and the position was then taken by Harry Cassidy. The latter was transferred to Chicago and F. C. Hintzman was given the position, which he held until a few months ago, when he also was transferred, being succeeded by F. C. Lewis. The latter is now in charge of the plant.

Labor Day Racing

New York, Sept. 2.—Labor Day race meets were scheduled today for Manhattan Beach, Vailsburg, Madison Square Garden, Trenton, New Brunswick, Asbury Park, Bayonne and Maspeth, at all of which metropolitan riders competed. The annual Coney Island Cycle Path 25-mile handicap was also run. It was rainy or threatening all day and a shower at the hour of starting caused the calling off of the Elkes-McFarland-McDuffee race and the Kramer-Lawson match at the Beach.

At Vailsburg the half-mile open professional race was run, championship style, and was won by Taylor, who beat Fisher in the final. The two mile handicap on the money chasers was run at a terrific gait by the middle and long markers in 3.57 4-5. The order of the finish was Rutz (150), Bedell (150), Ross (180), Bardgett (150). King and Hamilton won the motor tandem race, capturing the 2 and 5-mile heats in 2.56 1-5 and 7.17-4-5, the quarter mile heat falling to Shultz and Bennett, of Cleveland. Billington won the half mile amateur from Seralit in 59 4-5, and Glasson (200) the five-miles in 11.10.

There was racing at the garden at night. McFarland beat Taylor in a motor paced match a yard at a mile in 1.38 3-5 and 40 yards at 2 miles in 3.17 4-5. The four cornered match heat race at a half a mile was won by Kramer, who beat Lawson in the final. Cooper beat Fisher for third money in a special heat. Hurley won the amateur heat race from Schrieber, Gus Welsing winning third from Van Cott on a foul. Van Cott beat Schreiber in the half mile open with Lake third. Two colored boys carried off first and second in the mile handicap. Dove (60) won in 2.02 3-5 with Brooks (20) second, Coyte (100) third, and Laurie (80) fourth. Henri Fournier made an indoor record on a motor bicycle, riding a mile in 1.34 3-5.

A rather bad mix-up of judges, riders and spectators marred the finish of the annual Coney Island Path 25-mile handicap. G. Perden, of Brooklyn, with 3-minutes handicap, won in 1:05.47 2-5. Edward Forrest, K. C. W., scratch, won the time prize in 1:02.48 2-5, a new record for the course.

McFarland in Form Again

Newark, N. J., Sept. 1.—Most of the professionals were at Vailsburg yesterday and competed in the 2-mile open, the only monied event on the card for the afternoon. Prizes were given the leaders of the laps and a terrific pace was the result. McFarland was the winner by a half length in 4.06 1-5, with Fisher, Cooper and Wilson bunched in this order. Little Joe Nelson beat Harry Edwards, of Brockton, Mass., in a 10-mile motor paced race by nearly a lap, leading after three miles. The time was 17.05.

"Major" Dove won the colored championship from "Colonel" Brooks in two straight heats at a half and mile. Dove also captured the ten mile open, 23.20 2-5. Billington led at five miles and Beyerman captured the lap prize.

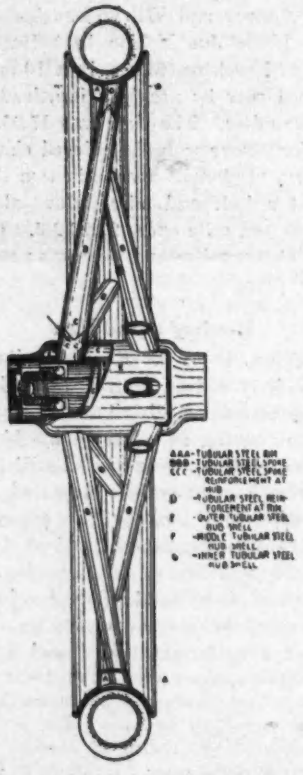
Standing of the Men

New York, Sept. 2.—Kramer sails along serenely in the lead in the championship race, the occasional distributed victories of the others having no effect on his big margin. Last week Lawson pulled still farther away from Taylor and Fenn passed Fisher and Cooper and took fourth place. The championship struggle will end at Charles River Park next Friday and Saturday, when the national individual championships at the six standard distances of a quarter, a third and a half mile, and 1 and 5 miles. With double points scored in these races there is still a chance for Kramer to lose by a succession of defeats. The score up to the close of the racing at Revere Beach on Saturday night was: Kramer, 67; Lawson, 39; Taylor, 32; Fenn, 20; Fisher, 17; Cooper, 14; Wilson and Collett, 12 each; Freeman, 9; Gascoyne, 8; Kimble, 6; Housman, Tone, Butler and Newhouse, 1 each.

Ralph Temple has secured the Chicago agency for the White steam vehicle, made by the White Sewing Machine Co., of Cleveland.

INFORMATION FOR BUYERS AND BUILDERS

Two years have elapsed since the gentlemen who are now at the head of the Midgley Mfg. Co., of Columbus, O., commenced work on the tubular wheel which is the company's specialty. It was introduced to the trade and public at the Chicago show, last March, and the indications are that it will become a part of the equipment of many of the auto-


AAA-TUBULAR STEEL RIM
BBB-TUBULAR STEEL SPOKE
CCC-TUBULAR STEEL SPOKE REINFORCEMENT AT HUB
D-TUBULAR STEEL RIM REINFORCEMENT AT RIM
E-OUTER TUBULAR STEEL HUB SHELL
F-MIDDLE TUBULAR STEEL HUB SHELL
G-INNER TUBULAR STEEL HUB SHELL

mobiles of the future. The wheel has been manufactured and tested for the last 15 months. It is substantially constructed for combined driving and carrying of the load. The hub is formed from three tubular shells, the spokes passing through two of the shells, butting on the third shell, with a strong reenforcement passing up on the inside of the spoke above the outer shell, giving a long brazing surface. The spokes and rims are formed from 14, 16 and 18 gauge steels, according to the weight to be carried. Rims are rolled in two sections, an inner and outer, with an interlocking groove on the flaring edge, and when rolled in shape and brazed form a tubular rim, one of the strongest constructions in steel. The spokes are forced in the inner rim, with strong re-enforcements and after assembling the wheel is dipped in a crucible of molten brass, every joint being thoroughly brazed and all thoroughly lined with brass, making a practically continuous tube of hub, spokes and rim.

The Midgley tubular steel wheel is now in practical use on Locomobiles, Wintons, Steamobiles, Milwaukees and other vehicles, and is in the hands of many manufacturers for experimental work. Several sets are on vehicles which are entered in the endurance contest between New York and Buffalo. The company is in receipt of many complimentary letters on the satisfactory work of this wheel, and claims it to be far superior to either the wood or wire. It cannot dish, crush or buckle; it will withstand all side shocks; its spokes will not loosen or snap, and when properly enameled can easily be kept clean. Indeed, the makers say that after a year's use the wheel will be as presentable as when first placed on a vehicle.

A Convenient Gasoline Tank

One of the first questions confronting many purchasers of a motor carriage is where and how to keep the gasoline. Many insurance companies greatly increase their rates if any considerable amount of it is kept within a building. Several solutions to this problem are offered by S. F. Bowser & Co., Fort Wayne, Ind. One, which will appeal particularly to a great number of that class who object to the fumes of gasoline, almost

CHAIN TRANSMISSION OF POWER
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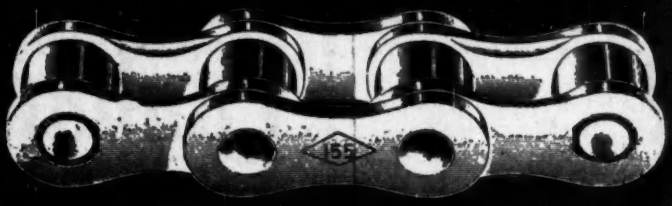
ONLY when frictional rivet surface and tensile strength are large in proportion to the working load.



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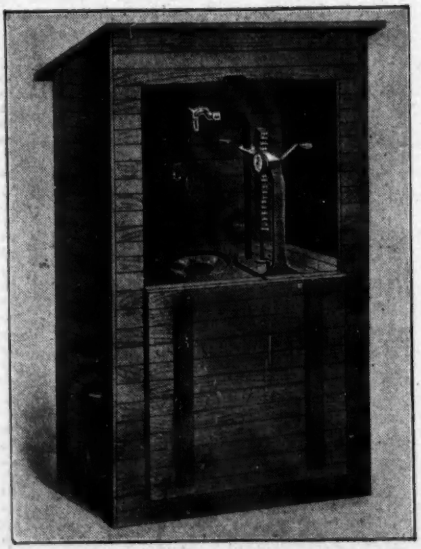
Equip your machines with large chains and avoid trouble. *Diamond Chains* have large nickel steel hard rivets, are accurate and highly finished.

The Automobile and Cycle Parts Co.

DIAMOND CHAIN FACTORY

INDIANAPOLIS, IND.

unavoidable where it is kept in large quantities, is an outdoor cabinet tank, shown in



the accompanying illustration. This device is a square tank, built of galvanized steel, double seamed and turned and soldered inside and out and fitted with the company's patent measuring pump, so arranged as to measure a gallon, half gallon or quart at a stroke and put the liquid into the desired vessel without the use of measures or funnels. The cabinet to this outfit is well constructed and well painted, grained and varnished. The roof is covered with tin and the door is arranged to be padlocked. If desired, double swing doors will be furnished. The company can also furnish several desirable outfits wherein the tank is kept outside the building and a pipe is run from the tank to the pump, which may be located wherever convenient.

A New Rushmore Light

The Adams-McMurtry Co., 114 Fifth avenue, New York, which manufactures the Rushmore automobile searchlight, which has been described in these columns, has placed on the market a side-light for automobiles, built on the same lines as the powerful Rushmore, but not quite so big. It has lenses 7 inches in diameter, red side lights, and the size of the flame can be con-

trolled from the seat. Two of these lamps on a carriage will illuminate the road 1,400 feet ahead.

The Powell Throttle Valve

Several manufacturers of steam vehicles have recently adopted a disk type throttle valve, known as the Titan, manufactured by the Wm. Powell Co., Cincinnati. It is one of the most ingenious devices of its kind ever put on the market and avoids many ob-

jectionable features common to disk valves, particularly the difficulty of securing a perfectly tight seating of the disks when closed under pressure, as well as the labor of operation caused by undue friction of the wedging devices often used. In the Powell valve the disks are loosely coupled to links and are brought to their proper position, opposite the seats, and come to rest before any wedging friction is developed. The wedge then passes between studs on the disks, forcing the latter firmly against the seats. In the reverse movement of the lever to unseat the disks the wedge is withdrawn from between them while they are still at rest. The disks then collapse and the further movement of the carrier brings them to the position of full opening with little or no labor to the operator, no matter how great the pressure or how large the valve. These valves are made in two sizes adapted to 175 pounds and 350 pounds working pressure.

A Portable Automobile House

One of the latest devices offered the user of an automobile is a portable house manufactured by E. F. Hodgson, Dover, Mass. Many intending purchasers of automobiles hesitate on account of lack of proper accommodations and hesitate to go to the expense

FOR SALE

FOR IMMEDIATE DELIVERY
AN 8-HORSEPOWER

Panhard-Levassor

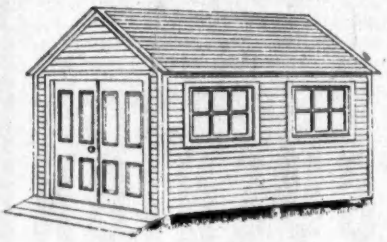
CARRIAGE

Carries six persons. Aluminum Tonneau body. Speed 45 miles an hour. Including duplicate parts of everything not kept in stock in America and all necessary tools.

The carriage is in splendid condition, having been recently painted and enameled.

MOTOR AGE
324 Dearborn Street,
CHICAGO

of building a stable to thoroughly protect the machine from the weather. The house shown in the illustration is made of the best quality of cypress, is painted ready for use and is guaranteed to be storm-proof. It is shipped in sections and may be set up by any one familiar with the use of ordinary carpenters' tools. The general dimensions of



the most popular size is 10 feet square, height 9 feet at the peak and 6 feet at the eaves. The doors are 6 feet wide and 6½ feet high. It is provided with four windows and outside incline. The manufacturer carries two other sizes, 8x8 and 8x10 respectively.

The Remington Launch

That the Remington company has developed a highly satisfactory motor for marine purposes has been demonstrated by a trip just made from New York to Utica at a cost of less than one cent a mile for a 20-foot boat designed to carry 12 people. Contrary to many builders of boat motors the Remington is of the four-cycle type. The exhaust is under water. In general arrangement the boat follows the generally accepted lines.

The Remington has been in operation about a month at Washington Heights, North River. She has carried thousands of passengers to the bathing pavilions. Philo E. Remington with a companion brought the boat up from New York. She will be kept in Utica to demonstrate the operation of the motor made by the Remington Automobile & Motor Co.

Mr. Remington started with the boat from New York Monday noon and reached Newburg, 60 miles, the same evening. The distance from New York to Troy, 160 miles, was made in 19 hours actual running time, or better than 8 miles an hour.

Starts From the Seat

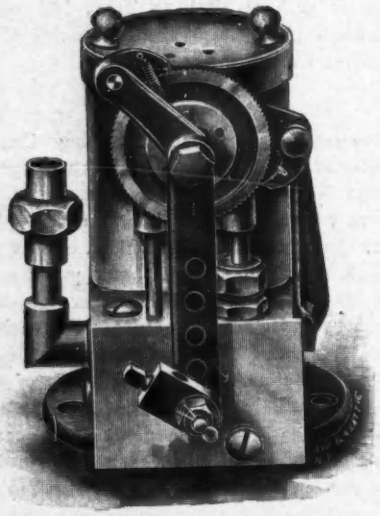
The International Motor Carriage Co., 35 Nassau street, New York, points with pride to the fact that its carriage is one of the few in which the motor is started from the seat. Inserting a Yale lock key, closing the electric ignition circuit, and pressing a foot lever are all that is necessary to start the motor. One lever regulates the various speed gears, and a foot button regulates the speed of the motor. The motor is of the two-cylinder balanced type, developing about 5 horsepower. The carriage will carry enough gasoline at one charge to run 150

THE INTERNATIONAL CARRIAGE.

miles. The carriage is attractive in design and has 32-inch front and 36-inch rear wheels.

The Rochester Lubricator

A new appliance, which will be appreciated by owners of steam vehicles, is the Pony Rochester automatic lubricator. Those who have had experience know that lubricators that depend on gravitation or hydrostatic pressure from condensed steam to transmit the oil of the cylinder often feed too much or too little. They continue to feed the same quantity when the vehicle is stopped as when it is propelled at high speed, causing



waste. The makers say that by the use of the automatic lubricator the valves and cylinders receive an accurate and positive lubrication. It is operated by connecting the arm or lever of the lubricator to any moving part of the engine or power equipment from which it receives its motive power. It starts and stops automatically with the engine and conforms with all variations of speed. When the vehicle is propelled at high speed the lubricator is operated accordingly, and feeds oil to the valves and cylinder rapidly, and its action is slackened with the slowing down of the vehicle, and stopped entirely when the latter stops. It is manufactured by Green, Tweed & Co., 17 Murray street, New York, and is exactly the same model, reduced, as the well-known Rochester lubricator, which has been in use in large power plants for several years.

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WITH

SPEED

IS THE

CUSHION

FRAME

MOTTO

THE CUSHION FRAME is **positively** the **greatest bicycle invention** since the advent **of the pneumatic tire.** It practically increases the **resiliency** of the tire **four fold** without in the least detracting from the speed or power of the wheel (as compared with the so-called rigid frame). **The most enthusiastic converts** to the **Cushion Frame** are the **old-time speedy** "get there" riders who at first "scoffed" the idea of COMFORT being combined with "speed and power" in a bicycle. :: :: :: ::

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(no top) latest improvements, used six weeks - - - - - - $550

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FOR SALE—The Automobile Storage and Repair Co., 57 West 66th St., New York, have new and second-hand steam, gasoline, and electric carriages constantly on hand and have always some spec al bargains.

NO. 2 LOCOMOBILE, first-class condition $485.00; No. 2 Locomobile, almost new, been run 75 miles, $650.00; brand new "Locosurrey," $1,075; Orient quad, $300. I personally guarantee all the above. In stock ready for immediate shipment. A. L. DYKE, Auto Supplies, office Linmar Bldg., St. Louis, Mo.

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AGENT WANTED to purchase second-hand bicycles. Address INTERNATIONAL BICYCLE CO., Shanghai, China. 9

WANTED—Complete fittings, including engine for building motor bicycles and cars. Quote lowest pr.ces and send drawings and particulars at once. Must be cheap. IMPERIAL CYCLE AND MOTOR CO., Upper Trinity Street, Birmingham, England. 1

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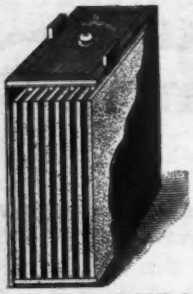
The Xander automobile jack and torch heater, of which a great many are being made by the Xander Machine & Supply Co., is a useful combination. The torch part of it is operated by pouring a little gasoline into a trough and lighting it. The jack saves much lifting, as with one hand a vehicle can be lifted in a moment. In ordering the diameter of the wheel should be given. The jack is covered at the point of contact with the vehicle with leather and when placed in an inclined position a push with the hand will lift the wheel clear of the ground.

Allow me to congratulate you on the MOTOR AGE. I have studied it carefully for some time and prefer it to any of the other magazines, of which I get all. I would not miss the valuable information I get from it for anything. The MOTOR AGE is as nigh perfect as one could expect.—G. W. Henricks, Indianapolis.



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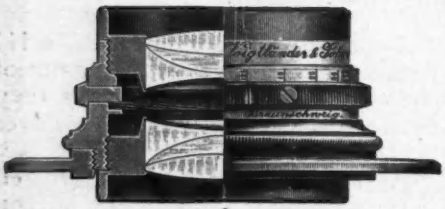

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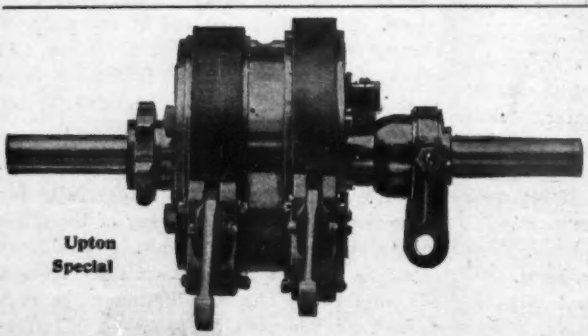

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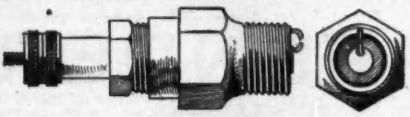

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Our prices are **$2.00** each, singly, and **$13.50** in lots of one dozen—net cash with order. We have bicycle motors in 1, 1¼ and 1¾ h. p. sizes; water jacketed in 4, 7, 10 and 15 h. p. sizes; running gears and all parts necessary for constructing steam or gasoline vehicles. We represent the complete line of Dow coils, batteries, etc., suitable for all forms of gas and gasoline engine ignition. These are the **best by every test** and we can prove it to our competitors or the trade upon request.

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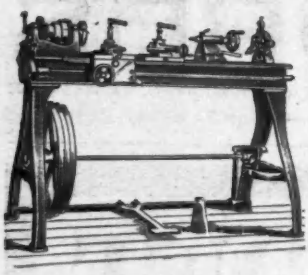

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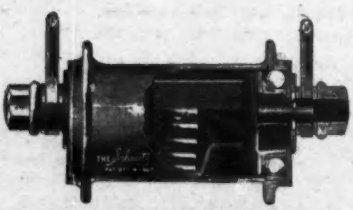

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Won First Time Prize May 30th, 1901, in Century Road Race. Reduced record, which stood for 4 years, by 30 minutes.

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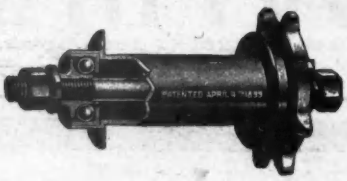

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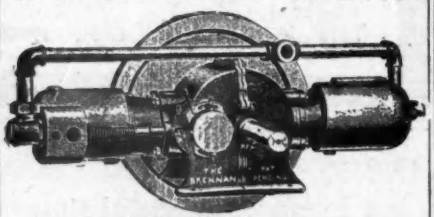

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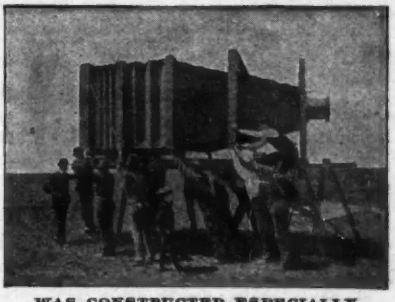

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